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ANNALS

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Volume XXVIII

MARCH, 1938

No. 1

Standard Seasons

MARK JEFFERSON

For the man of our interest summer is simply the warm time and winter the cool time where he lives. How cool or how warm is not involved at all. The term is purely relative. Actually summer at Breckenridge, Colorado, is much cooler than winter at Miami, Florida. The words have no absolute, no quantitative meaning. Yet water freezes everywhere at 32° F. and given temperatures have definite effects on the growth of plants. Miami entices outsiders by its winter and repels by its summer. Breckenridge repels by its winter and attracts by its summer. If potatoes are grown at Breckenridge it must be in summer, but Florida potatoes are a winter growth.

It is clear that geography could use terms of less elusive content. For this purpose it is here proposed to revive two almost forgotten words—*torrid* for summer and *frigid* for winter. Xenophon foreshadowed their use in 400 B.C. when he quoted a description of Persia as “reaching on the north to where men cannot live for the cold and on the south to where they cannot live for the heat.” Clear, like all Greek descriptions, but as usual with insufficient facts of observation behind. From that grew up the legend of a frigid zone where you would be frozen stiff, and a torrid zone where you would be burnt to a crisp. We are not afraid of them today. We have been there and know that men may live there even with a certain comfort.

But a frigid-winter might be defined as a winter with at least one month averaging through all its temperatures below 50° F. That would be definite by the thermometer at any rate. Also, as climates go, there would be a month with touches of snow and ice, a reasonable concomitant of a frigid month. The men that I have called the men of our interest, more than 58% of the people of the earth, have frigid-winters.

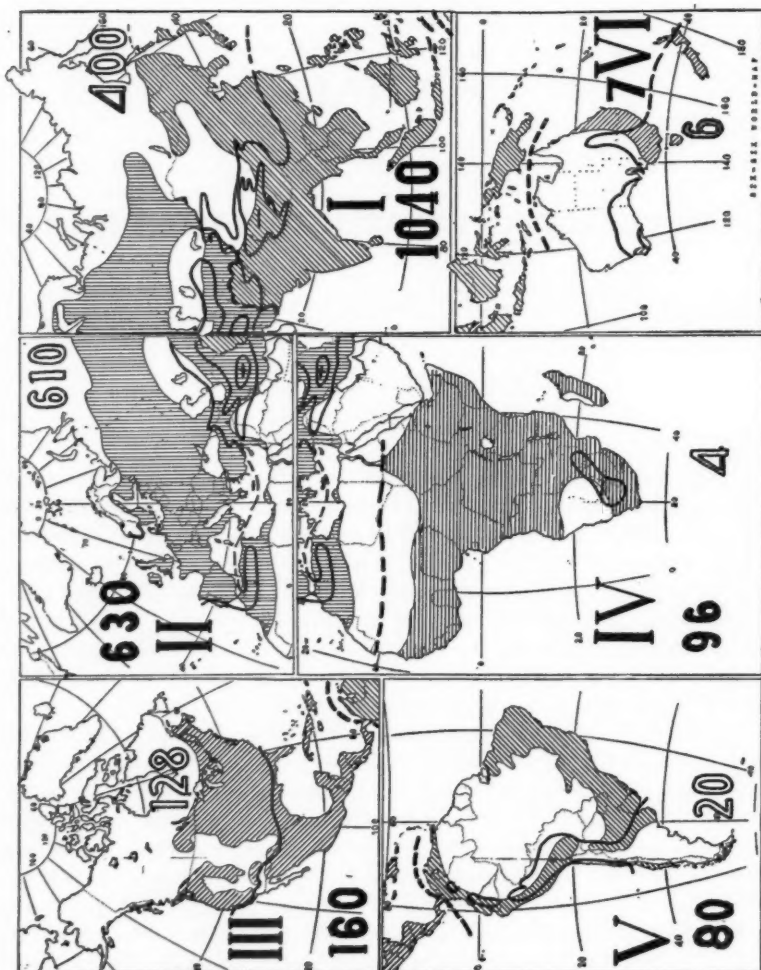


FIG. 1.—Six (I-VI) main groups of the world's inhabitants with total numbers in each one expressed by solid Arabic numerals in millions (*e.g.*, 1040 in east Asia) and those in the group who have a frigid-winter indicated by the open faced Arabic numerals (*e.g.*, 400 in east Asia). The heavy line sets off the frigid-winter regions in both hemispheres. The estimates of population are by M. Jefferson for 1930.

Who are these men of our interest? They wrote the books we read or their forebears did. They read our books. They have thoughts we wish to keep up with. They listen for ours. They invent things, make things we want. They use the things we make, use our inventions, use our sciences and our arts. They share with us the general art of making nature serve us rather than oppress and torment us. They are the men we know most about of all the inhabitants of the earth. Their doings and plannings figure in our daily news. Now these men live where standard winter, frigid-winter comes. They know something, all of them, of snow and ice.

The inhabitants of the earth live in six groups nearly coinciding with the six continents (Fig. 1). The biggest of these is 1040 millions of people in eastern Asia. Second come 630 millions in Europe, North Africa and Western Asia. In southern North America 160 millions. In Africa south of Sahara 96 millions. In South America 80 millions, and 7 millions in Australia and New Zealand.

If these groups of men are shaded on a map of the world and a heavy line drawn on the map through all the places that have no month below 50° F., 58% of the people of the world will be found living to the north of this line in the northern hemisphere or in the southern hemisphere to the south of similar lines drawn there. They have frigid-winter. They are the people of our interest. Four hundred millions in Asia, 610 millions in Europe, 128 millions in North America, 20 millions in South America, 4 millions in Africa and 6 millions in Australia.

Europe has more of them than Asia because 97% of its inhabitants have frigid-winter. Only 28% in Asia, but the 400 millions there are in Japan and mid and northern China, surely the Asiatics of our interest. It is astonishing how this line, now sufficiently founded on actual observations, sets off the countries where civilization mainly stirs. China and Japan, Australia and New Zealand, all Europe, Canada, most of the United States, South Africa, Argentine, Chile and parts of Peru and Bolivia. They number in all 1168 millions, 58% of the people of the world.

Florida hotel keepers will not object to our calling Florida winterless. It is their business to sell that winterlessness to their clients. Yet there may be 1% of the inhabitants of the state so out of touch with the January visitors that the statement annoys them. "No winter! All nonsense. Of course we have winter and the nicest time of the year too." Dwellers in the city of Mexico have their coolest month averaging, between days and night, 54° F. But the Mexican knows very well that he has winter. Being mostly without fire in his house he recalls it with distinct discomfort. December afternoons rarely fall below 60° F. but the nights regularly come within a few degrees of freezing. We shall do well to call our standard winter frigid. Frigid-winter Miami and Mexico city do not have.

The accepted use of summer and winter is the *time when* it is warm and cool. The idea is not standardized, but the standard concept is useful. To avoid confusion, however, we must use distinctive words. Frigid-winter has been suggested. Torrid-summer is its opposite. It has no convenient earmark like the snow of frigid-winter. The standard here proposed of at least one month averaging above 68° F. cuts out from our standard summer 443 millions of northern Europeans, all except those who dwell near the Mediterranean. They know they have a summer. Perhaps they may accept the statement that torrid-summer heat they have not. Ideas about heat, concepts of temperature-comfort differ strongly. About 1900 the secretary of the Royal Geographical Society criticized the writer for the statement that American janitors tried to maintain a winter temperature in schoolhouses of 70° F. "It is much too warm," he wrote, as if it had been recommended, "I am sitting here very comfortably without any fire and the window open and the outside temperature is 55 degrees." Americans would not feel so, and I may add *do not dress so!* We must say *torrid-summer* and *frigid-winter*.

There are 483 millions of the people of our interest who get no torrid month, a third of the total number. Their seasons are frigid-winter and what we must call spring-fall between frigid-winters. This has the twofold aspect of our spring and fall, early burgeoning and blossoming of plants awakened from the slumber of frigid-winter, and ripening of seeds and fruits and the fall of deciduous leaves as another frigid-winter draws on, but the two aspects merge. They are not separated by torrid months. As temperature should count it, those regions have two seasons, not four. They are important people, those 483 millions without torrid months. Most of Europe, Japan north of mid Honshiu, Canada, northern Michigan and northern New England, with a few millions in New Zealand, Victoria, South Africa and South America. Frigid-winter, it appears, is coincident upon the earth with the people of our interest. Torrid-summer visit two thirds of these but the third omitted includes some of the most interesting of mankind.

The assertions made above are based on study of curves of annual temperatures as averaged by months. The ordinates for temperature are spaced according to the number of days in the different months. The date of beginning winter, for instance, is read by estimating the interval between ordinates to the point where the descending curve crosses the abscissa for 50° F. It would be difficult to estimate this date without possible error of two or three days.

As illustrations may serve here (Fig. 2) the curves for 12 torrid months at Key West, 6 torrid and 6 spring-fall months at New Orleans, Louisiana, 3 torrid and 6 frigid months at Columbus, Ohio, no torrid and 7 frigid ones

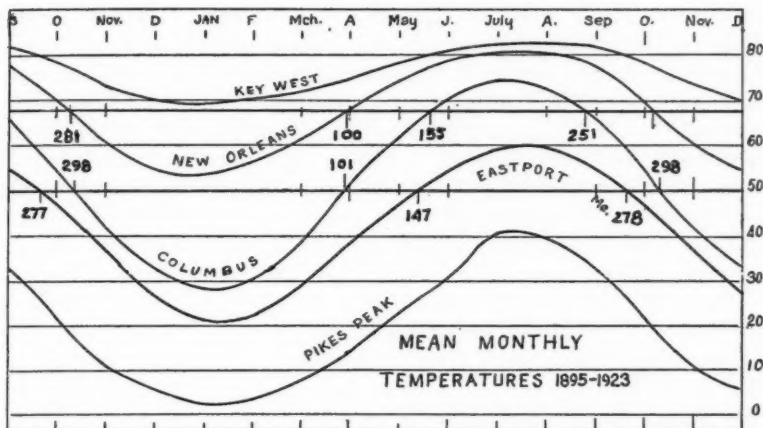


FIG. 2.—Annual temperature curves from monthly averages for type places. Dark horizontal lines indicate the critical temperatures 68° and 50°. Key West always torrid-summer, New Orleans torrid-summer and spring-fall, which began 281st day of the year (Oct. 7, except leap year), Columbus four seasons, Eastport, spring-fall and frigid-winter, Pike's Peak always frigid-winter. Eastport's two dates illustrate one day's allowance in reading dates from curve.

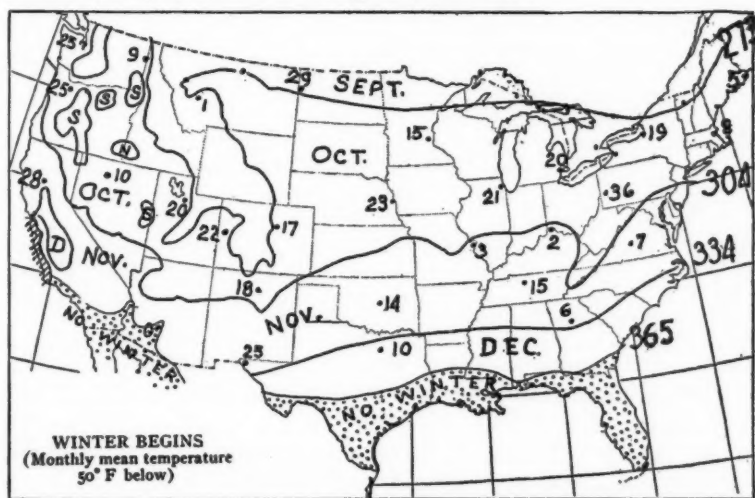


FIG. 3.—Dates of beginning of frigid-winter, when curve based on the mean temperature of the months falls below 50° F. Numbers at end of lines (e.g., 273) are days since the beginning of year to the month's end. Two dots in Montana are dated by the line, Sept. 30.

at Eastport, Maine, and 12 frigid months on Pikes Peak, Colorado. Pikes Peak seems to complete the series, but it is humanly unimportant.

The detailed studies are limited to the United States. The dates when fall passes into frigid-winter (Fig. 3) show winter progressing from north to south. At Williston, North Dakota, September 29, at St. Paul, Minnesota, October 15, Detroit, Michigan, October 20, November 2 at Cincinnati, Ohio, December 10 at Dallas, Texas. The Gulf coast is not reached at all. Isarithmic lines are drawn for the month-ends and are numbered in days since the beginning of the year. The speed of the advance southward steadily diminishes, 540 miles in October, 350 in November, and 210 in December.

With the year's end we see frigid winter retreating northward again (Fig. 4), gathering speed as it withdraws, 40 miles in January, 200 in Feb-

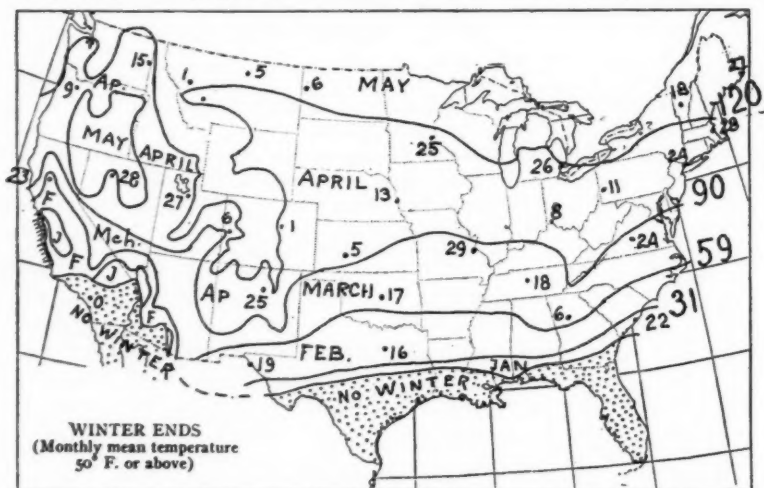


FIG. 4.—Dates of ending of frigid-winter, when curve based on mean temperatures of the months rises above 50° F. Numbers at ends of lines (e.g., 120) are days since beginning of the year to the month's end.

ruary, 300 in March, and 450 in April. Except near its turning point in the deep south frigid-winter sweeps southward across the country at 12 miles and northward at 11 miles a day.¹

The retreat of frigid-winter is the advent of spring, "cheery spring after a dull winter." Winter is so good for us that we tire of it! There is constant public inquiry as to the date of spring. The spring Equinox will not do. It is astronomical, not geographical. Spring comes with the blossoming

¹ The data are from Koeppen-Geiger *Handbuch der Klimatologie, Band II, Teil II*, by R. DeC. Ward and C. F. Brooks. Berlin, 1936.

and leafing-out of plants at progressive dates as here shown. It is at Charleston, South Carolina, January 22, at Dallas, February 16, at Nashville, Tennessee, March 18, at Cincinnati, April 8, at Detroit, April 26, and at Williston, May the 6th. The intervals between these dates of frigid-winter's coming and going are lengths of frigid-winter in days, 31 days at Charleston, 72 at Dallas, 104 at Atlanta, Georgia, 145 at St. Louis, Missouri, 182 at New York, and 192 at Detroit.

Similarly torrid-summer makes its excursion across the country advancing from south to north (Fig. 5), slowing its rate of advance as it goes. At

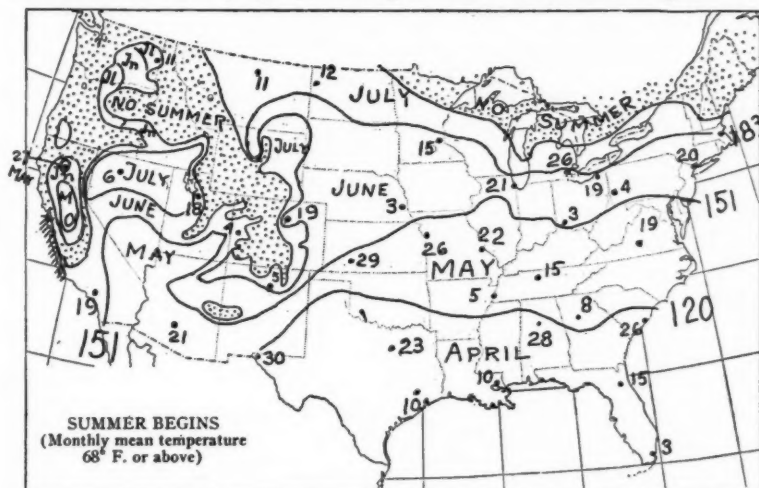


FIG. 5.—Dates of beginning of torrid-summer, when curve based on mean temperatures of the months rises above 68° F. Numbers at ends of lines (e.g., 183) are days since the beginning of the year to the month's end.

New Orleans April 10, Memphis, Tennessee, May 5, Chicago, Illinois, June 21, and Williston, July 12—then to turn southward, giving Detroit for beginning of fall August 25, St. Louis, September 21, Atlanta, September 27, and Charleston, Oct. 12 (Fig. 6). The length of torrid-summer is 365 days at Key West, Florida, 195 at New Orleans, 65 days at Detroit, and 10 at Williston.

The lack of torrid weather is an important economic resource of northern New England and northern Michigan. The Rocky Mountains too have 20 inhabited points above the torrid heat of known temperature. They have no month averaging above 68° F.

The lengths of spring between frigid-winter and torrid-summer and fall

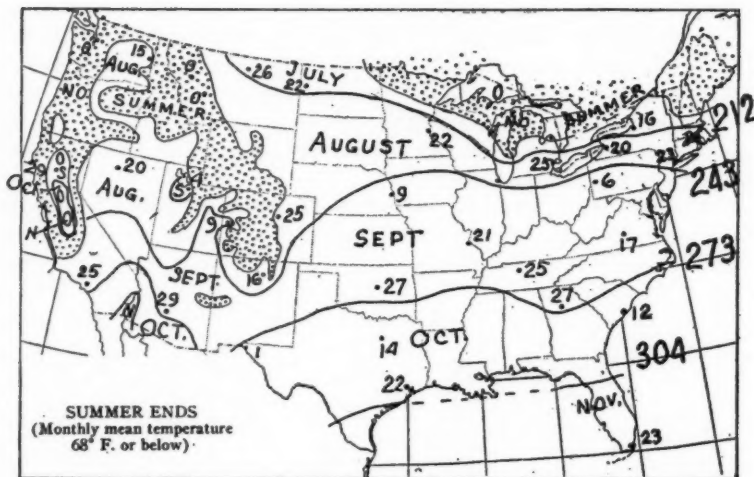


FIG. 6.—Dates of end of torrid-summer, when curve based on mean temperature of the months falls below 68° F. Numbers at end of lines (e.g., 212) are days since beginning of year to the month's end.

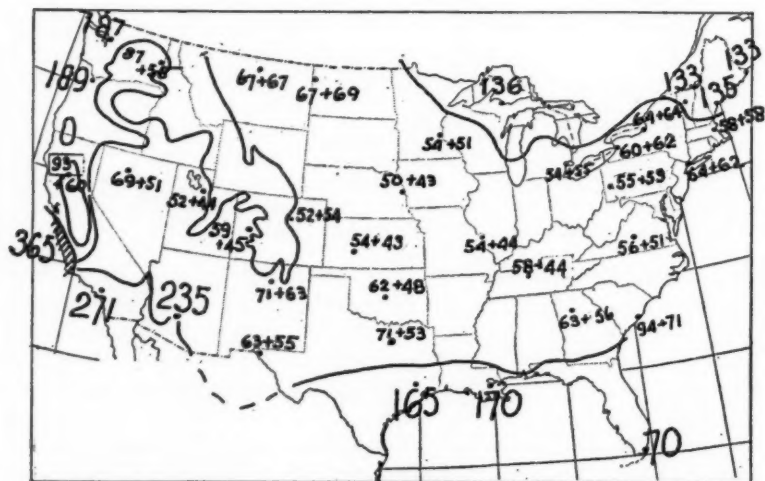


FIG. 7.—The number of days in spring and fall. In small numerals number in spring plus number in fall. In large numerals number in spring-fall.

between summer and winter (Fig. 7) are comparable, with spring usually a little the longer. This one can only call spring-fall. Doubtless in its earlier parts plants leaf out and blossom and towards its end seeds form and leaves fall.

What happens when there is no torrid-summer between? There must be a grading. As we look further and further north torrid-summer is 3 months, 2 months, one month, less than a month, none at all and then the combined spring and fall (spring-fall) begins to shorten from 6 months to 5, 4, 3, approximating a year of all frigid temperatures. But there is lack of the scorching period of torrid-summer between which makes fall especially grateful.

To the all-year resident of Miami, spring-fall must come as a welcome release from the long torrid-summer. Its spring end can hardly be significant. There is no frigid-winter to recover from and vegetation is hardly justified in falling asleep. But spring-fall at Miami is but two months long and its pleasant warmth in December and January is the main resource of the region. Spring-fall at Marquette, Michigan, is four months long and has been a minor resource. All the maps show the 12 months of spring-fall between Santa Barbara and Santa Cruz on the California coast. The number of people who live there is small as at most places in the world with that type of temperatures.

How far these dates for the seasons are to be depended on may be checked by the New Haven record—150 years of temperature observations. On the average frigid-winter begins at New Haven October 22. In 1836 it began as early as October 5, in 1809 on November 7. Those seem to be the extreme cases in 150 years, 17 days earlier than the average and 16 days later. Spring comes to New Haven on the average April 24. In 1921 it came April 4, in 1847 on May 2, 20 days early and 8 days late. The end and beginning of winter, frigid-winter, in the long New Haven record have had an extreme variation of two weeks on either side of the average. Any single year may be expected to fall within 7 or 8 days of it.

For the current year (1937) the spring and fall thermograph-trace at Ypsilanti, shows this year's end and beginning of winter falling on April 25 and October 16, a 4-day cold spell introducing the winter and a 3-day warm spell ending it. The fall cold-spell stripped all the leaves from the catalpa trees Oct. 17—an example followed by most deciduous trees in the two weeks to follow. For the fall *ends* with the fall of the leaf, at least in the United States. It does not begin with it, and since the cause is physical, it must happen then in England too. It is curious that frigid-winter in London begins on the average October 15 and ends April 25, almost the same dates as at Detroit (October 20, April 26) although London lacks the torrid-sum-

mer which Detroit interposes between June 21 and August 25. Deciduous leaves should fall near London, October 20. Most of the people of the U. S. live in four-season-land, a few millions in two-season or one-season land (Fig. 8) and standard seasons matter to all the world.



FIG. 8.—Most of the United States has the four seasons: spring, torrid-summer, fall, and frigid-winter. About a fifth of the country in the north and the western mountains frigid-winter and spring-fall, an even smaller region in the south torrid-summer and spring-fall, and a tiny region on the south Pacific coast only spring-fall.

Our frost folks number 1159 millions, the frostless 854 millions. As the frost knowers live on 8 of the world's 28 million square miles of surface—inhabited surface, *ecumene*—our customary notion of teeming populations in the hot lands must be revised. The present writer pointed out many years ago that the "teeming population of Oriental cities" was quite mythical—and disappears when you *count*. New York city has denser population in some wards than any Oriental city that has been counted.

The frost-folks have an average density of population of 148 to the square mile, ranging from 15 per square mile on Australia's inhabited lands to 267 on the frost-knowing part of eastern Asia. The frostless 854 millions have a density of but 48 per square mile. Frosty weather may be unwelcome but it appears to be a distinct advantage in man's self-assumed task of populating the earth.

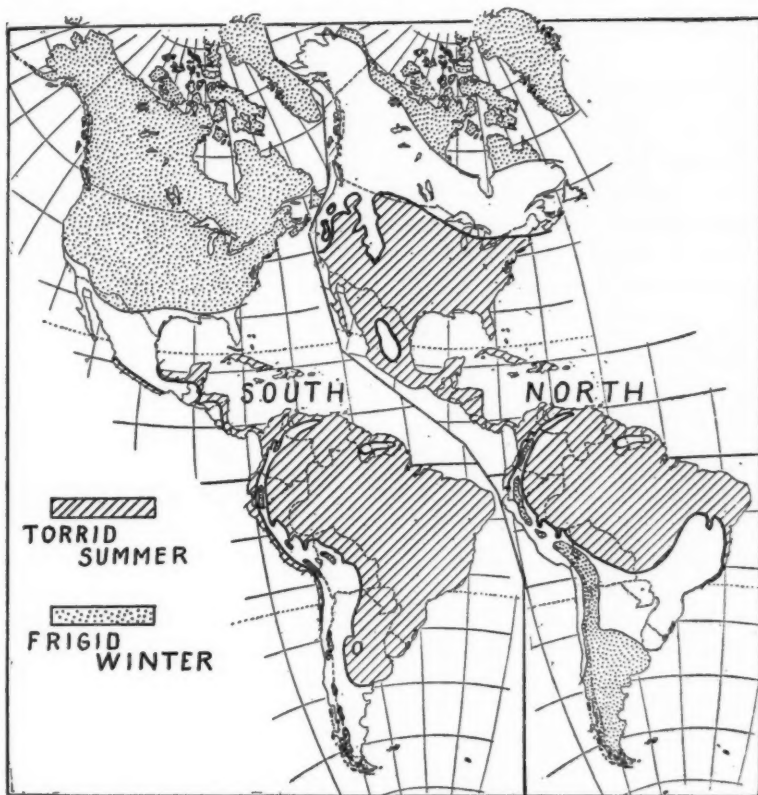


FIG. 9.—Migrations of torrid summer (cross-lined) and frigid winter (dotted). North in July and south in December. Redrawn from the author's "World Diagrams" (1908), and "Exercises in Human Geography" (1935), page 21.

Figure 9 shows where our torrid summer comes from in spring and where it goes to in the fall, while frigid winter expands and contracts at the poles.

It is not true that the southern hemisphere has winter when the northern has summer. Our torrid summer of July extends across the Caribbean, the Orinoco and Amazon basins to Rio Janeiro at the southern Tropic. In December it still lingers near Key West near the northern Tropic and stretches from there to Bahia Blanca in the southern part of the Argentine. The torrid weather of July covers over four million miles of the northern hemisphere but also two million south of the equator. In December torrid sum-

mer covers over a million miles north of the equator and four million south of it.

The low grounds of the tropics have torrid summer always, which extends its northern and southern borders northward and southward with the sun as it swings north and south.

Frigid winter resides permanently at the poles in separate areas that remain four to six thousand miles apart, the northern one covering six or seven million square miles of North America in December, the southern one a tenth as much of South America in July.

*Michigan State Normal College,
December, 1937.*

Items in the Regional Geography of Panamá:

With Some Comments on Some Comments on Contemporary Geographic Method

ROBT. S. PLATT

PROLOGUE

Can regional geography "claim a place in the academic world" or contribute to scholarship or to science? Are regional geographers engaged in a worthier enterprise than following "the vain dream of a science of regions" over "the sterile ground of regional description"? Does the growing literature of regional geography promise something better than "a vision of the whole surface of the earth plastered with topographic descriptions—like the baggage of a round-the-world tourist with hotel stickers"?¹

The purposes and prospects of regional geography are properly open to question and have been questioned from time to time. In hope of shedding some light on such questions and as a starting point for abstract discussion of the subject, an example of regional geographic work is here presented. This study is part of a project of reconnaissance touching the major regions of Latin America—a project in which final integrated presentation will relate the parts to the whole, but in which meanwhile some parts are offered individually as current items of regional geography.²

¹ Leighly, J.: "Some Comments on Contemporary Geographic Method," in *Ann. Assn. Amer. Geogr.*, Vol. 27 (1937), pp. 125-141.

² *Editor's Note*.—This is the latest item in a long series of case studies in the regional geography of Latin America already published by the author.

In a few of these papers larger regional relations are suggested: "Magdalena Atlipac, A Survey of Terrene Occupancy in Mexico," in V. C. Finch and R. S. Platt: *Geographic Surveys, Geog. Soc. Chicago Bull.* No. 9 [1933], pp. 47-75; "An Air Traverse of Central America," in *Ann. Assn. Amer. Geogr.*, Vol. 24 [1934], pp. 29-39; "Conflicting Territorial Claims in the Upper Amazon," in Harris Foundation Lectures, 1937, *Geographic Aspects of International Relations* (Chicago, 1938).

In others the larger relations to regions, to other studies and to the whole project are included only by implication: "Geography of a Sugar District: Mariel Cuba," in *Geog. Rev.*, Vol. 19 [1929], pp. 603-612; "Pattern of Land Occupancy in the Mexican Laguna District," in *Trans. Illinois State Acad. Sci.*, Vol. 22 [1930], pp. 533-541; "Pirovano: Items in the Argentine Pattern of Terrene Occupancy," in *Ann. Assn.*

The field study sites chosen for discussion here seem particularly exposed to questions regarding their possible significance in any way contributing to scholarship: they do look like travel stickers on a map (Fig. 1); and they

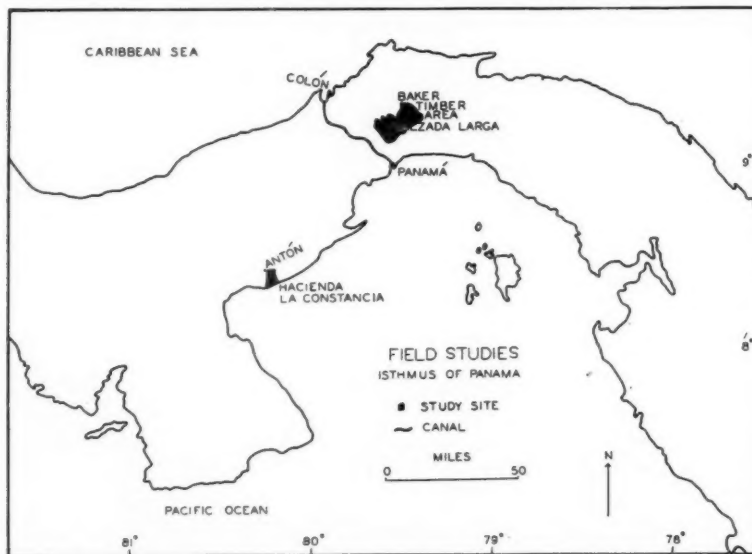


FIG. 1.—The base used for Figures 1, 9, and 15 to 23 inclusive is drawn from:—American Geographical Society: *Millionth Map of Hispanic America*, Panamá sheet [1928]; Villegas, S. A.: *Mapa de la Republica de Panamá*, 1:500,000 [1925].

represent reconnaissance in an area which is so well known that it may seem unsuitable for regional scientific work on a reconnaissance scale or otherwise.

The Isthmus of Panamá is at least better known than most of Antarctica and numerable other places. Factual knowledge about Panamá has been accumulating for centuries, accurate maps of the Isthmus have been made,

Amer. Geogr., Vol. 21 [1931], pp. 215-237; "Peripheral Items in the Argentine Pattern of Terrene Occupancy," in *Trans. Illinois State Acad. Sci.*, Vol. 24 [1931], pp. 410-423; "Six Farms in the Central Andes," in *Geog. Rev.*, Vol. 22 [1932], pp. 245-259; "Items in the Chilean Pattern of Occupance," in *Bull. Geog. Soc. Phila.*, Vol. 32 [1934], pp. 33-41; "Pattern of Occupance in the Maracaibo Basin," in *Ann. Assn. Amer. Geogr.*, Vol. 24 [1934], pp. 157-173; "Coffee Plantations of Brazil," in *Geog. Rev.*, Vol. 25 [1935], pp. 231-239; "A Curaçao Farmstead," in *Jour. of Geog.*, Vol. 35 [1936], pp. 154-156; "Mining Patterns of Occupance in Five South American Districts," in *Econ. Geog.*, Vol. 12 [1936], pp. 340-350; etc.

The field work has been completed for the whole project, but most of the items remain unpublished awaiting consolidation of the series in a monographic unit.

voluminous statistics have been collected, and many phenomena have been subjected to intensive scientific analysis.

The reconnaissance here recorded was done on short notice. The particular spots studied in the field were chosen by accidental opportunity accepted through a desire for Central American regional data. Within the range allowed for exercise of selective judgment the study was directed by the following considerations: (1) that the Isthmus of Panamá is not completely revealed in the Canal and its accessories, (2) that for brief naïve study attention should be given not to the Canal Zone, where vast research has been done, but to outlying areas, where reconnaissance seems more becoming, (3) that noticeable rural occupance is evident in outlying areas southwest of the Canal Zone, (4) that forest lands are in evidence east of the Zone. Accordingly a spot in the southwest was reached for one study, and a spot east of the Zone for another. A glimpse of these two places will serve as a basis for further consideration of the geography of the Isthmus of Panamá.

ANTÓN

Hacienda La Constancia is in the District of Antón, Province of Coclé, in the "interior" of the Republic of Panamá (Fig. 1). The fact that the hacienda is close to the Pacific and has an ocean frontage does not prevent it from being "interior" in the sense that every place which is far from the



FIG. 2.—Farmyard at the owner's house, Hacienda La Constancia.

historic isthmian crossing place and therefore far from the heart of the country is "interior." The hacienda is eighty miles southwest of the capital city, Panamá.

The property studied is an estate of Spanish colonial origin owned by a Panamanian of Spanish descent. The owner's house is a comfortable villa on the bank of a stream, approached by an avenue of coconut palms, surrounded by fruit trees and overgrown with vines (Fig. 2). Elsewhere in the hacienda in scattered clusters are the houses of mestizo laborers, of whom there are about two hundred (Fig. 3).



FIG. 3.—Group of laborers' houses in the llanos, Hacienda La Constancia. Landscape in the dry season. In the foreground dry grass has been burned off to make way for new growth.

Formerly the property had an area of approximately fourteen square miles defined by the ocean on the south, the interior highway on the north, and small streams on east and west. Recently the area has been reduced to about eleven square miles by sale to the government of a tract of land near the shore for rural settlement purposes.

The land of the hacienda is of two primary types: (1) llano or savannah land and (2) natural woodland, of which part is still wooded and part recently cleared (Fig. 4). The grasslands occupy interstream areas for the most part (Fig. 5). The woodlands are along streams and along the coast (Fig. 6). The woods are not confined to valleys and are not everywhere separated from the llanos by distinct physiographic breaks, but in general they occupy lower land than the grass.

The llanos are undulating uplands, underlain by clay, covered with native grass, green and luxuriant during eight months of rain, brown and dry during four months of drought. The general aspect is like that of tropical savannahs elsewhere.

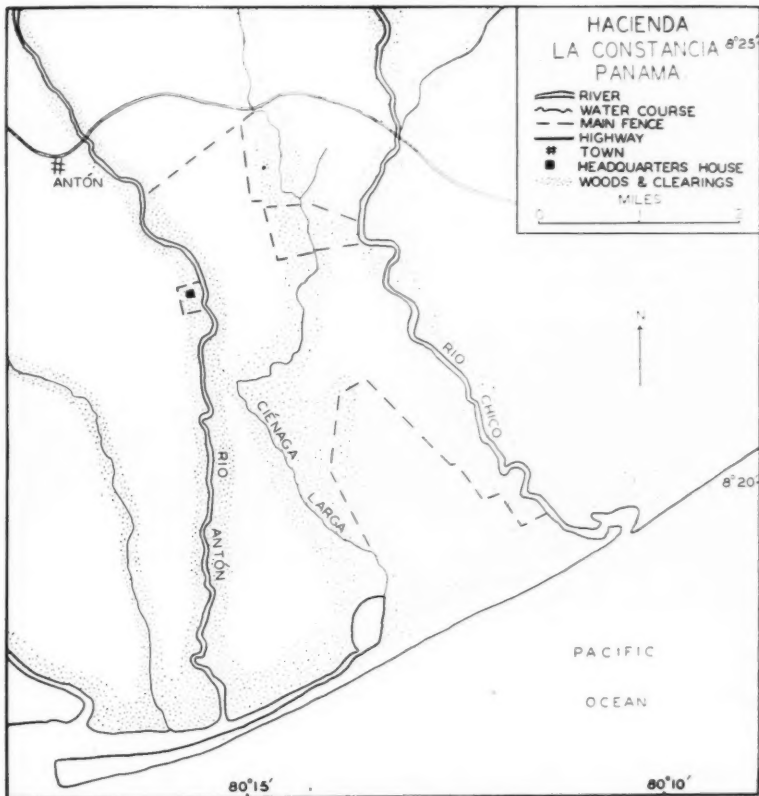


FIG. 4.—Data from:—Cadastral maps of the hacienda; reconnaissance. Unshaded areas are natural grassland (savannah, llano). Data are lacking for showing the distribution of clearings as distinct from woods. The boundaries between woodlands and grasslands are generalized and not precise for the same reason.

The woods are of mixed broadleaved trees and shrubs, some evergreen and some deciduous, with enough bare boughs and brown tints in the dry season to give an impression of early autumn (Fig. 7). Few if any of the wooded tracts are virgin forest.

As already indicated, part of the formerly wooded land is now cleared. In fact, a major part belongs in another category of land occupancy—or in two other categories: crop land, and planted pasture—*potrero* (Fig. 8). The former represents primitive shifting cultivation. Every year small patches of woodland are cleared by subsistence farmers. Trees are cut down



FIG. 5.—Cows grazing in the llanos, Antón, Province of Coclé, in the dry season. Looking north toward the central mountain ranges.



FIG. 6.—Rio Antón, Hacienda La Constancia (in the dry season), bordered by woods and pasture clearings.



FIG. 7.—Pacific coast near Antón in the dry season. Looking northeast.



FIG. 8.—Planted pasture, Hacienda La Constancia.

and burned in the dry season and supply crops grown in the rainy season. The favorite crops thus produced are corn, cassava and rice.

All this is incidental to the main function of the hacienda as a productive enterprise. The one year of supply crops is introductory to the planting of grass to occupy the land for an indefinite period—not the harsh native grass of the llanos, but more nutritious pasture, Guinea grass, planted by seed, or Pará grass, transplanted in clumps to spread and occupy the ground. Thus more than twenty per cent of the hacienda has been converted into pasture land capable of fattening cattle and having a carrying capacity of two head in three acres.

Animals do not fatten on the llanos, but they can subsist there through ten months of the year. Accordingly cows and their calves graze on the llanos, except during the last two months of the dry season, when they are kept temporarily in planted pasture. When calves grow to steers they are kept continuously in planted pasture until at four years of age they are ready for market. The stock is of unimproved mixed breed, low in beef production but resistant to ticks and other adversities of the region.

Annually about five hundred steers are taken by truck to Panamá city (Fig. 9). Current prosperity at the hacienda is due to the accessible city

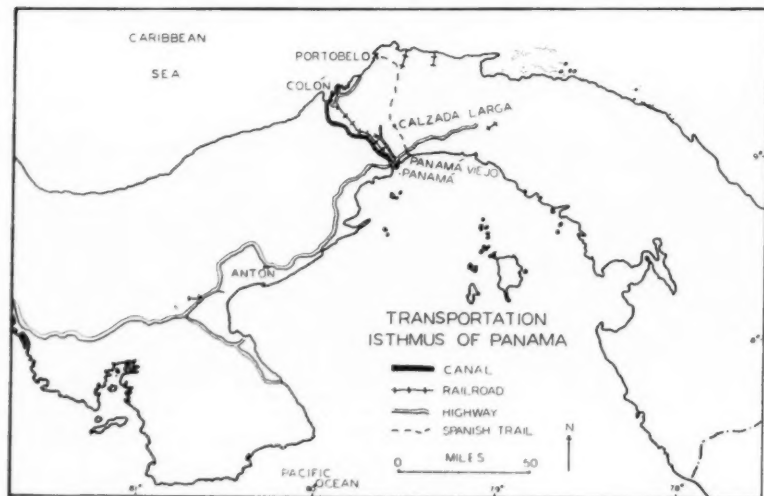


FIG. 9.—Data from:—Villegas, S. A.; *Mapa de la República de Panamá*, 1: 500,000, 1925; Long, W. R.: *Railways of Central America and the West Indies*, Washington, 1925, pp. 121, 146, 147; *Panamá American*, Feb. 16, 1936, p. 8; reconnaissance.

market for beef. But to the inhabitants themselves the Panama Canal is a far-off and unfamiliar phenomenon.

CALZADA LARGA

East of the Canal Zone is a tract of forest land held as a source of timber (Fig. 1). The area is fairly inaccessible, penetrated only by foot paths, in spite of the fact that major lines of transportation across the isthmus are not far away and that ancient routes from ocean to ocean passed directly through the tract, a trail of Spanish treasure moving northward across the isthmus in colonial days, and of California Forty-niners moving southward across the isthmus in the Nineteenth Century.

The straggling village known as Casa Larga in the midst of the tract does not seem to deserve its name of "large house" on the basis of its one-room thatched huts, but when its original uncorrupted name of Calzada Larga, "long road," is recalled, this seems entirely appropriate for a station on the old trail midway between the oceans (Fig. 10).



FIG. 10.—Village house, Calzada Larga. Trans-isthmian trail at the right; mixed mahogany forest in the background.

The tract is in the upper basin of the Rio Chagres, bounded by the river on the north and the continental divide on the south (Fig. 11). It has an area of about ninety square miles and is composed of three separate property holdings of Spanish colonial origin. The middle piece of property,

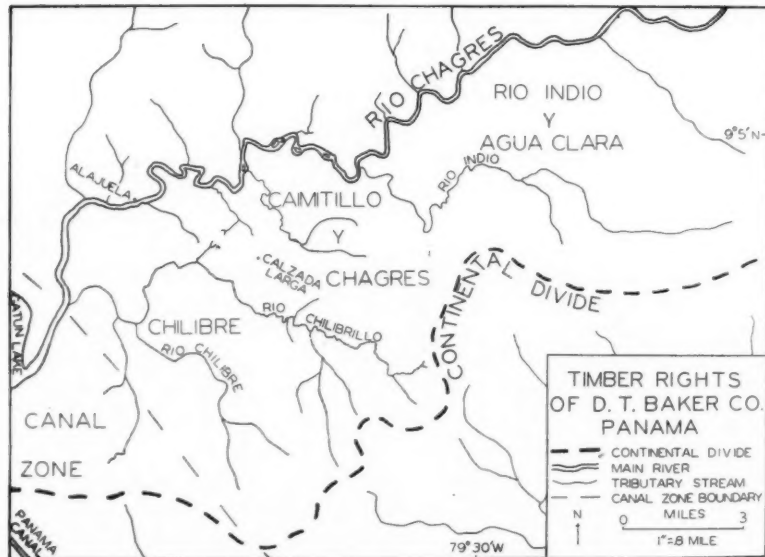


FIG. 11.—Data from:—Cadastral maps of land holdings; reconnaissance.

Caimitillo y Chagres, is owned by about fifty heirs, some of them Panamanians and some Ecuadoreans. The southwestern piece of property, Chilibre, is owned by a New Jersey corporation, and the northeastern piece, Rio Indio y Agua Clara, is owned by people in Sweden.

The timber rights over all three properties have been acquired by a small lumber company of Panamá city, D. T. Baker, after protracted negotiations with the owners in four nations. The transaction was facilitated when the absentee owners became aware that their valuable timber, unprotected from poachers, was gradually disappearing without any return to them. The purchaser of the timber pays the owners a small amount for every tree taken out.

The Baker Company in its turn cannot afford to guard the whole tract against unauthorized wood choppers, but has stopped the stealing of timber by a simple device. A watchman posted at the mouth of the Rio Chilibre impounds all logs driven down the river. Since there is no feasible way of taking logs from the area except by the river, one watchman is sufficient. Every man bringing logs down the river is offered as much for his timber as it would cost the company to have the same amount extracted by its own men. If the offer is refused the logs are held under embargo pending a court decision. The company might have difficulty proving in court that such

logs were from their land, but no cases are carried to court. The lumberjacks prefer to avoid court action and with apparent satisfaction accept the payment offered for their logs. Thus potential poachers become authorized workers for the company.

The interest of lumbermen is due entirely to trees of one kind, mahogany. Here in the midst of the isthmus are hills and valleys covered with mixed forest (Fig. 12). It is more luxuriant than the woodlands of Antón and



FIG. 12

FIG. 12.—Mixed forest, Calzado Larga area.



FIG. 14

FIG. 14.—Mahogany tree felled in the forest of Calzada Larga. Remaining logs in the foreground, the first log having been rolled away to a nearby stream; stump in background; lumberjack standing by.

greener in the dry season, but it is distinctly not rain forest. There are even a few grassy openings suggesting the llanos of Antón. Mahogany trees are scattered through the forest, not in pure stands, but more plentiful than is common in such forests, one per acre in the best parts of the area (Fig. 13).

As already implied the work of extraction is not highly organized. Whether the lumberjacks are employees of the company or free lancers the methods are about the same. Men go into the woods at any season, though generally avoiding the rainier parts of the wet season and the early part of



FIG. 13.—Mahogany tree in the mixed forest of Calzada Larga. The notch made with an ax marks the beginning of felling. One of the two lumberjacks stands in the background.

the dry season. Two men work together. A tree of good size is selected and felled with ax and saw. Two or three hours are required for felling and two or three days for sawing into logs of movable length, eight or ten feet (Fig. 14). Two men alone cannot move the logs, but they cut an eight or ten foot path to the nearest water course and later with the help of two or three other men roll the logs down the path and into the stream. If circumstances are unfavorable for rolling on a wide path, the logs are dragged lengthwise by a larger gang of men.

For five months there is water enough in the smaller tributaries to carry logs down to the main river, whence they are floated along an eastern arm of Gatun Lake to a boom in the vicinity of the Canal. Beyond this point the waterway is not available for timber, but a highway is available, on which trucks carry the logs to Panamá city. The Baker Company has a small sawmill from which the product is distributed to the local market for cabinet wood.

Some mahogany from Panamá enters world markets. Yet the forests along the old transisthmian route and close to the Canal Zone, containing an abundance of large mahogany trees, have survived to the present, and having survived do not now furnish an export product. A reason for this apparent oversight seems to be provided by the facts of the case. Presumably

the old treasure hunters were not interested in mahogany, because of their other interests; and the modern exporters are not interested in this particular mahogany, because it is unusually light in weight and therefore classified as of low grade. Botanically the tree is like other Central American mahogany according to seed tests. Seed from this area of abundant seed bearers is in demand for planting elsewhere and mahogany seed is an export product of the Baker Company. Possibly the low grade wood is a result of natural conditions too favorable for tree growth, encouraging rapid and abundant development without retardation by drought. The annual rainfall is almost a hundred inches in the Chagres area, somewhat more than in certain other areas of mahogany production. Facts of regional distribution beyond the small area of field observation have a bearing on the subject, and some of these facts are next in order for consideration.

ISTHMUS OF PANAMÁ

To bring the study to a head the field reconnaissance was followed by library reconnaissance, also limited unavoidably in scope. These two parts of the study are considered supplementary not only in the gathering of data, in which field observation has given direction to library work, but also in the presentation of results, in which field materials are expected to provide the color and texture of constituent details, and library materials to provide coherence and correlation in the field of knowledge. The preceding descriptions of hacienda and forest are based primarily on field data and only slightly on library data. The following maps and comments are based primarily on library data and secondarily on field data. Accurate maps and voluminous statistics are available for the Isthmus of Panamá,³ as previously mentioned.

Attention is directed to the Isthmus of Panamá not as a geographic region of assumed uniformity but as an area of land conveniently designated. This area is marked by a complex pattern of phenomena, natural and cultural. The pattern is observable and more or less understandable, and the areal distribution of each constituent phenomenon is subject to investigation separately and in association with the distribution of any other phenomena.

The selection of phenomena for representation in the accompanying maps

³ In the case of maps the following compilations are so good that for general purposes nothing better can be expected:

(1) American Geographical Society: *Millionth Map of Hispanic America*, Panamá sheet, 1928.

(2) Villegas, S. A.: *Mapa de la República de Panamá*, 1:500,000, 1925.

For various statistics the following are available:

(1) Panamá Departamento de Estadística: *Anuario de Estadística*.

(2) Panamá Dirección General del Censo: *Censo Demográfico*.

is based on (1) availability of data and (2) relevancy of data to the small units of field observation. Certain elements of the areal complex of hacienda and forest are thus exposed in a pattern of regional scale. A few comments on the maps and their contents will serve to bring this part of the study into view.

The map of population (Fig. 15) shows a concentration of people south-

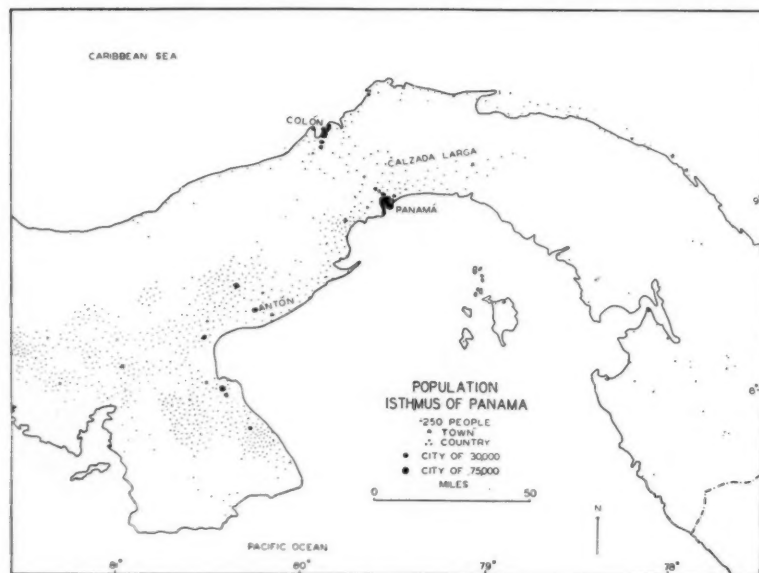


FIG. 15.—Data from:—Panamá Dirección General del Censo: *Censo Demográfico*, 1930, Vol. 2, pp. 173-262; United States Bureau of the Census: *Fifteenth Census of the United States*, 1930, Vol. 1, pp. 1246-1248.

west of the Canal Zone in an area including the District of Antón. This representation is correct within the limits allowed by the study. A census⁴ gives the population of the Isthmus distributed statistically among 50 districts, subdivided into 2800 communities—*poblaciones*. For each district there is also a distinction between town and country population. All of the districts are located on the base map made for this study (Fig. 16), but only a minority of the 2800 communities have been found located by name.

⁴ For the Republic of Panamá:—Panamá Dirección General del Censo: *Censo Demográfico*, 1930; for the Canal Zone:—United States Bureau of the Census: *Fifteenth Census of the United States*, 1930.

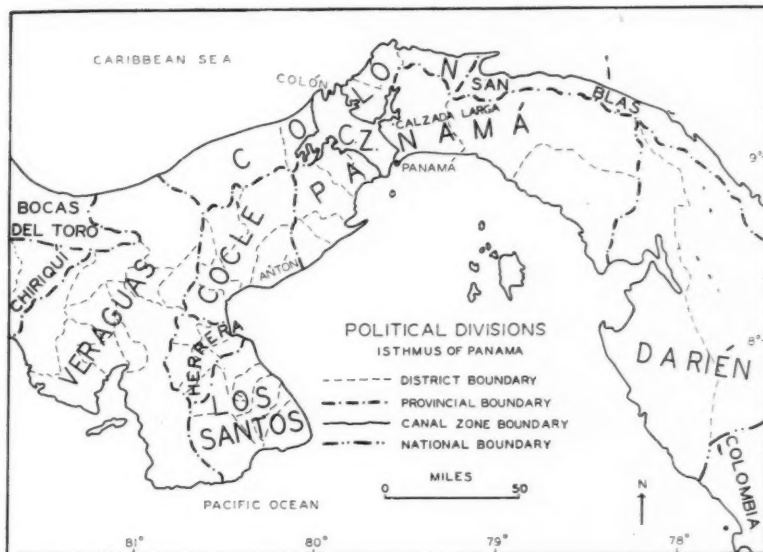


FIG. 16.—Drawn from:—American Geographical Society: *Millionth Map of Hispanic America*, Panamá sheet [1928]; Villegas, S. A.: *Mapa de la República de Panamá*, 1: 500,000 [1925].

Therefore within the known districts the distribution of unknown communities has been deduced from circumstantial evidence, such as the distribution of known communities, roads and land forms. The result is untrustworthy for precise detail but depicts the general pattern.

Consider some associations of other phenomena with that of population. Details on the map of natural vegetation (Fig. 17) also are based largely on circumstantial evidence. Direct evidence comes only from observation on the ground in and near the Canal Zone and observation from the air in flights through the length of the Isthmus on the Caribbean slope, through the western part of the Isthmus on the Pacific slope, and across in two places. The distinction between rain forest and wet and dry forest is not sharp, and is not to be made with finality from the air or from the literature. In making this map it has been assumed from good but not conclusive evidence that all forests of the Caribbean coast are rain forest and those of the Pacific coast wet and dry forest, and that the divide between these two types approximates the mountain backbone of the country.

The other category on the map, that of savannah, has a landscape expression so distinct from forest that there need be no doubt of its classification and delimitation if observed either from the ground or from the air.

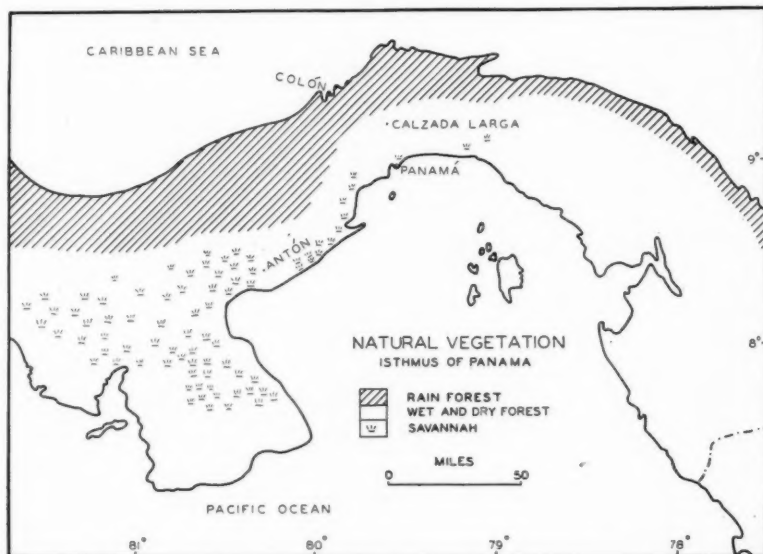


FIG. 17.—Data from:—Place names in Panamá Dirección General del Censo: *Censo Demográfico*, 1930, Vol. 2, pp. 184-262; reconnaissance.

This very fact raises a problem of map representation, because of the incompleteness of direct observation covering the boundaries of savannah lands and because of considerable irregularity in savannah distribution.

Lacking other criteria for definite localization of savannahs the census publication⁵ has been found useful as a source of meager but objective data. The census list of 2800 communities has been scanned for all place names indicating grassland—such names as *sabana*, *sabaneta*, *sabanilla*, *llano*, *llanita*, *llanura*, *pajanilla*, *pajonal*, *zacatal* and *pradera*. Other names which have a grassland connotation but which may as well refer to a forest clearing (*potrero*) or to marsh (*carrizal*, *cañaza*) have not been used. Every instance of a name considered to be an acceptable indicator has been plotted in its district and is represented by a symbol on the map.

Individual savannah areas differ greatly in size, some savannahs are not represented by place names in the census, and possibly there are a few grassland names which are misnomers. But in general the distribution thus disclosed is in accordance with evidence from other sources. Areal association of savannah lands with rural population in the southwestern provinces is noticeable.

⁵ Panamá Dirección General del Censo: *loc. cit.*



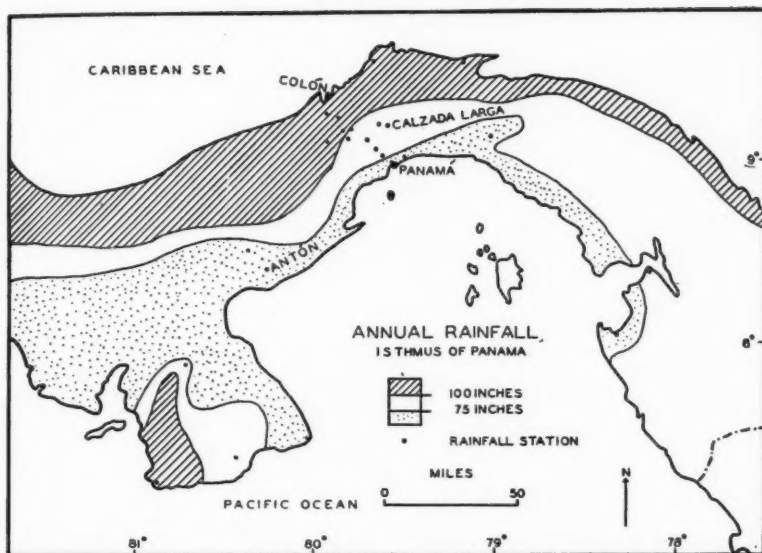


FIG. 18.—Data from:—Sapper, W.: "Klimakunde von Mittelamerika," *Köppen und Geiger Handbuch der Klimatologie*, Vol. 2, pp. H 31, 44, 45, 58, 64; Panamá Departamento de Estadística: *Anuario de Estadística*, 1934, p. 10.

Field reconnaissance bearing on precipitation (Fig. 18) is necessarily indirect and unreliable, through aspects of vegetation and through hearsay. Direct data are available for the Canal Zone from numerous rainfall stations. But for distribution in the Republic outside of the Zone the few existing stations do little more than tantalize the cartographer of isohyets. Not providing for a delicate placement of lines, they only serve to indicate that the lines on this map are smooth and simple because of lack of data, and that smoothness and simplicity would disappear if the factual gaps were filled. Naturally this is even more certain for seasonal details and variations than for total annual averages. In general the savannahs appear to be in areas averaging less than 75 inches of rainfall annually.

Distribution of other phenomena is consistent with facts thus far presented. For things of definitely recorded localization problems of cartographic representation are simpler. On the map of beef cattle production (Fig. 19) dots representing local slaughtering are clustered around abattoirs, and those representing shipment to city markets are scattered back of shipment points. To indicate production and avoid duplication the map omits slaughtering at Panamá city and Colón, the consuming markets which

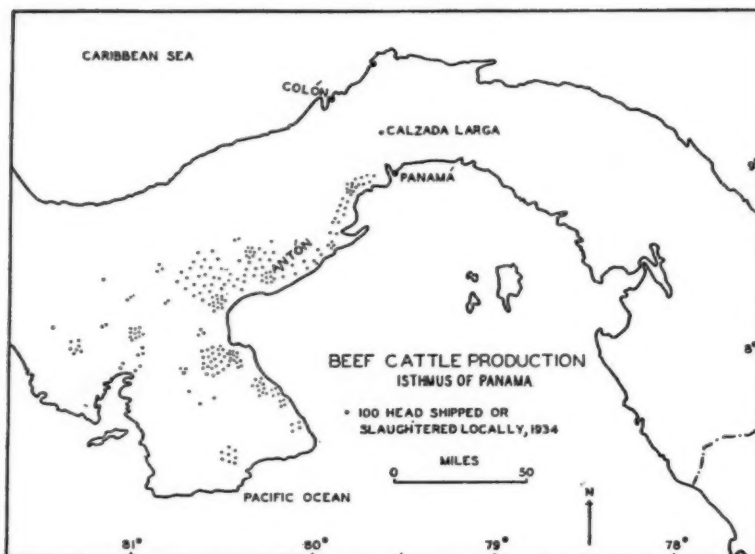


FIG. 19.—Data from:—Panamá Departamento de Estadística: *Anuario de Estadística*, 1934, pp. 141, 370, 378, 380, 393.

receive all the shipments shown on the map and in addition receive imports of beef from abroad. In general the production of beef cattle appears localized in the southwestern area of rural population, savannahs and less heavy rainfall.

Agricultural production is not well represented in available statistics. But one crop provides a rough indication of the distribution of agriculture (Fig. 20). Rice has been mentioned as among the favorite supply crops grown in new clearings at the hacienda. Distribution of rice by districts on the map does not correspond in detail with that of other mapped phenomena; such undeciphered differences proclaim the reconnaissance quality of this study. But general localization in the southwestern provinces appears in this case as in others.

Thus far discussion touching the regional pattern of the Isthmus has been tied to the hacienda in the southwestern area of rural population, savannahs, cattle, and crops, rather than to the other field study site, the forest of Calzada Larga. Yet scant mention in these notes does not imply that the forest has a negative place in the regional pattern.

The map of mahogany production (Fig. 21) is based on statistics for shipping points. The districts of mahogany production are large and one important shipping point has not been precisely located. Therefore details

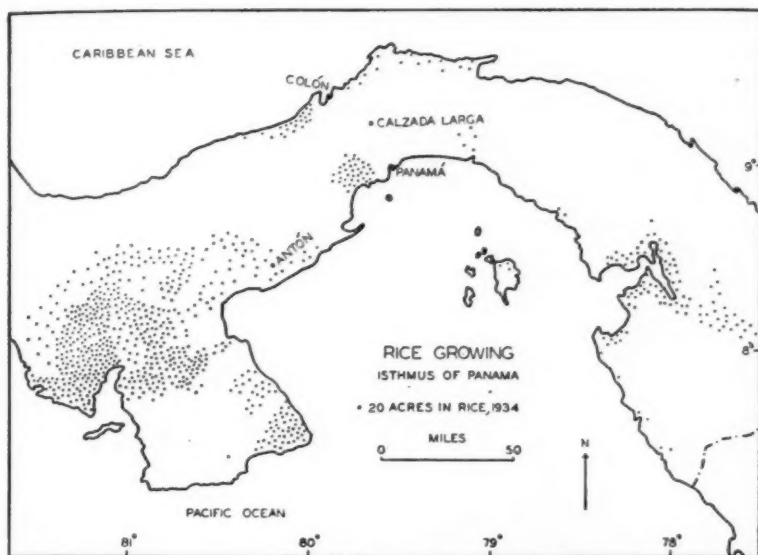


FIG. 20.—Data from:—Panamá Departamento de Estadística: *Anuario de Estadística*, 1934, p. 139.

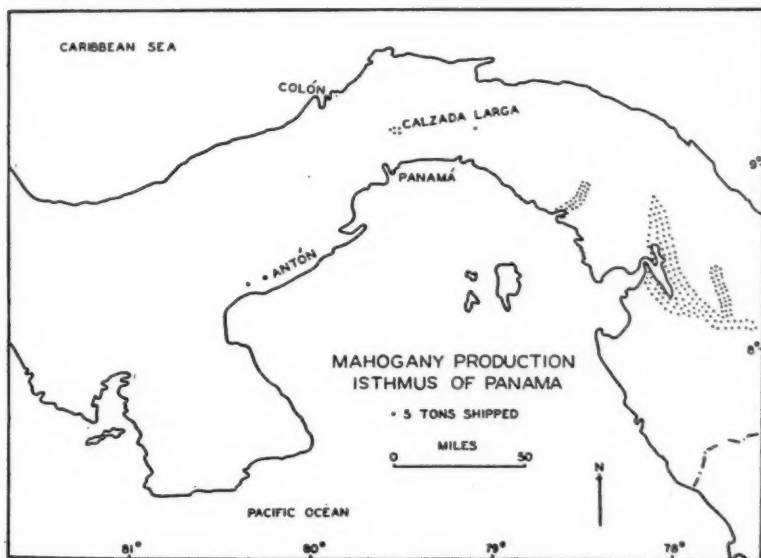


FIG. 21.—Data from:—Panamá Departamento de Estadística: *Anuario de Estadística*, 1934, p. 375.

of distribution are shown less satisfactorily than on the other dot maps. The dots for mahogany have been distributed along waterways upstream from shipping points. Dots have been added from estimate at Calzada Larga, because the statistics include only shipments by sea.

Apparently all mahogany production in Panamá is on the Pacific side of the mountains east of the Canal Zone. This area is characterized not by rain forest nor savannahs but by wet and dry forests (Fig. 17) in areas of moderate rainfall rather than of maximum rainfall or severe seasonal drought (Fig. 18). Such distribution of forest and rainfall is consistent with the more pronounced mountain barrier west of the Canal Zone and less pronounced barrier east of the Zone to separate the Pacific slope from the Caribbean (Fig. 22).

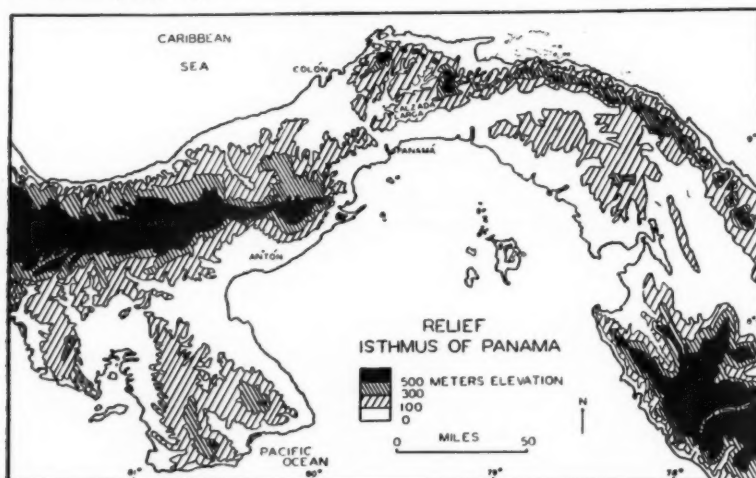


FIG. 22.—Drawn from:—American Geographical Society: *Millionth Map of Hispanic America*, Panamá sheet [1928]; Villegas, S. A.: *Mapa de la República de Panamá*, 1: 500,000 [1925].

The only place where mahogany production appears on the Caribbean side of the continental divide is at Calzada Larga in the Chagres basin, and this is consistent with the additional fact that the Chagres basin is the only area where the main mountain wall is not at the continental divide but farther north near the Caribbean coast (Figs. 22 and 23). Thus the current reconnaissance reaches a finding of mahogany localization in the wet and dry forest of southeastern Panamá, a generalization which may be unimportant but which points the way to more specific details of distribution and association, important possibly and accessible certainly, through intensive regional study.

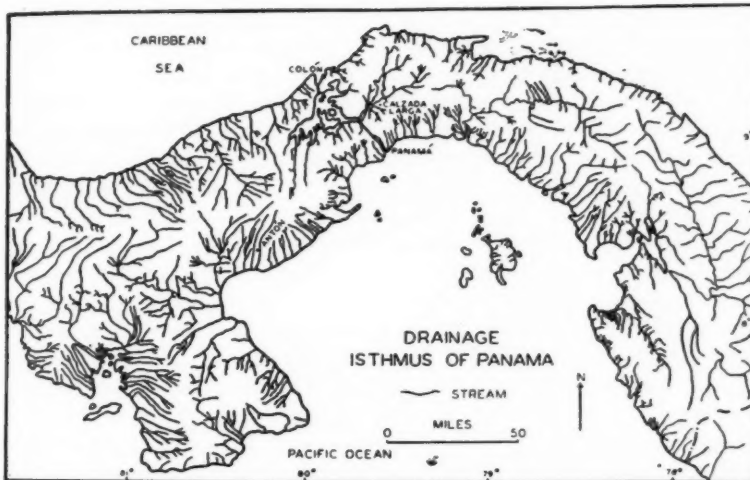


FIG. 23.—Drawn from:—American Geographical Society: *Millionth Map of Hispanic America*, Panamá sheet [1928]; Villegas, S. A.: *Mapa de la República de Panamá*, 1: 500,000 [1925].

EPILOGUE

Let no one suppose that this presentation is an effort at complete regional description and interpretation. Since completeness is the last objective in the field of knowledge, this fragment may serve as well as another to throw some light on questions asked at the outset.

The hacienda of Antón and the forest of Calzada Larga may be considered as random bits of land in the Isthmus of Panamá. Being items of impromptu selection they cannot be offered either as sites important in themselves or as examples typical of a large area. Are they anything but travel stickers on the map? Do they fit significantly into the regional pattern? Is the regional pattern itself significant? Is the areal distribution or association of phenomena worthy of and subject to depiction and interpretation? Is the preceding treatment of these things a scientific study?

Its possible status as science is open to question, for in part it depends upon subjective judgment, deals with phenomena which are incommensurable and heterogeneous as to their immediate origin, synthesizes, and describes without explaining.

The study might be classified as art, since of art it has been said:⁶ "Subjectivity distinguishes it from science." The "sanction" is that "of

⁶ This and succeeding quotations are from Leighly, J.: *op. cit.*

the artist alone." Regional "synthesis can be made only subjectively not rationally," "and art may continue . . . indefinitely to discover" the region "in new subjective experiences."

Regional geographers, agreeing that art is "intellectually respectable," may welcome the chance to be classified as artists. Designation of the preceding study as a work of art would be entirely acceptable to the author. Any claim to scientific standing is relinquished gladly, if geographic difficulties thus can be surmounted—such difficulties as are suggested by the following assertions: "No one can deny the obvious fact that the content of the landscape is extremely heterogeneous," and "there is no possibility of our finding a theory so penetrating that it will bring into rational order all or a large fraction of the heterogeneous elements," "there are no basic equations . . . on which a science of the cultural landscape can be built."

At the same time these landscape elements are not subjective but objective phenomena, and their areal association is to be reckoned with as an objective fact. Such a phrase as "the drab objectivity of map," coming from a scientific geographer, seems significant in admission both of objectivity and of subjective drabness. If phenomena mapped in their areal association seem drab to an unregional scientific geographer, instead of startlingly interesting as they do to a regional geographer, is it because they are not entirely commensurable and quantitative but partly incommensurable and qualitative? If this is the reason, then it is only natural that the world should look drab to the unregional scientist, because basically all objective phenomena are qualitative. Quantity without quality is objectively a nonentity. The quintessence of quantity is orderly arrangement; and arrangement implies the existence of something to be arranged. The mathematician cannot begin to measure significantly until he has something to measure, something of qualitative validity.

If the scientist as such can deal only with commensurables, then how can the geographical scientist deal with the qualitative incommensurables to discover commensurables which he can measure? This discovery might have to depend on the artist as the only one capable of dealing satisfactorily with "intellectual incommensurables." But it is not to be expected that scientist will ask artist for this information, and there is another better way to escape the dilemma: that is, for the scientist to become an artist, at least in slight degree, and to use his own intuitive faculties in recognizing qualitative categories upon which quantitative measurements can be made.

On the other hand geographical artists are enjoined to be somewhat scientific. The foregoing study involves the measuring and counting of many things—cattle, savannahs, and other phenomena of the Isthmus. A regional geographer may even assert that the items of the regional pattern in

their space relations are not heterogeneous but homogeneous, or more literally homologous; that their areal associations are commensurable and completely subject to quantitative expression; and that if measurement is the criterion of science then the precise study of regional distribution⁷ is no less scientific than "the topography of art."

The study of distribution may not insist on explanation with such emphasis as is sometimes attributed to science. Its approach may be properly naïve, without predilection for causes, either spacial or temporal, geographical or historical. But this approach does not avoid explanation. On the contrary it is directed toward explanation in the only scientific way, that of observed coincidence.

Probably we all are both scientists and artists to a greater or lesser degree. It would be unfortunate if this were not so, because, although we may protect ourselves from "psychic shock" by not reading the literature of regional geography, nevertheless we cannot avoid living in a region and experiencing the constant impact in our daily life of items "extremely heterogeneous," "incommensurable," and "wholly disconnected."

Some scientists may object to being called artists and *vice versa*. If so they need not accept a definition which leads individuals to straddle both fields. But the idea will remain the same. Subjective choice is inherent in scientific as well as in artistic work. Therefore the tolerance which has been granted to artists for subjective judgment should, by the nature of the case, be extended to scientists also. Great scientists reaching far forward into the unknown need more of such tolerance than little scientists feeling their way gingerly along hand in hand.

The scientist, of all people, is one to appreciate tolerance in research, because he knows that new work is understood fully only by the worker himself and is not subject immediately to a final alien judgment. A remark attributed to Einstein regarding the ability of only twelve men in the world to understand his work was not necessarily a sign of arrogance. Others publishing new findings can say as much and more. Corroboration or refutation may appear within the day, or may be delayed for a generation, but in every case it lags behind the work. First judgment in either art or science cannot depend upon complete understanding of the work itself so well as upon confidence in "the skill and intellectual integrity" of the worker.

When the time comes for final judgment we may not ask, Is it science or art? but only, Does it contribute to knowledge? The aim of regional geography as science or art seems not to be "the presentation of regions as they really are" but advancement with the other branches of learning toward valid, appreciative, comprehensive understanding of the world.

⁷ Wright, J. K.: "Some Measures of Distributions," in *Ann. Assn. Amer. Geogrs.*, Vol. 27 (1937), pp. 177-211.

In this aim we may well tolerate in others and in ourselves the so-called incompatible attributes of science and art. Quite likely these attributes are not really incompatible. If all objective reality is fundamentally qualitative, so all arrangement of reality may be fundamentally quantitative. At least we seem justified in assuming that orderliness and not chaos characterizes the arrangement of phenomena in the universe, that ultimate reality is homogeneous and not heterogeneous. Science and art seem to stand upon, or at least lean upon, such an assumption. Perhaps when the Last Trump blows on Judgment Day scientists and artists will be found approaching a common goal expressed in a single comprehensive formula.

At present we seem to be a long way from any such formula. Some disappointment at this situation is indicated in statements such as these: "There is no possibility of our finding a theory . . . that . . . will bring into rational order . . . the heterogeneous elements of the landscape, . . . no prospect of our finding such a theory, that is to say, unless it is of a mystical kind." Perhaps "mystical" is the right word to use at this point. To us in this generation the existence of the Earth with its curiously intricate quasi-chaotic orderliness and with us on it acting as we do may well seem to be "mystical."

*University of Chicago,
January, 1938.*

Hommage to Professor Richard Elwood Dodge

Among the men active in founding the Association of American Geographers, and in carrying it through its first trying decades, is Professor R. E. Dodge. As a token of the Association's recognition of its debt, the Council has directed that an illuminated parchment be presented to Professor Dodge on his seventieth birthday, which occurs on March thirtieth. The tribute engrossed on the parchment is as follows:

Upon the occasion of his seventieth birthday this tribute is extended to Professor Richard Elwood Dodge by the Association of American Geographers in recognition of his services as charter member, secretary, first editor of publications, president, and interested and active participant in its affairs.

[Signed] VERNOR C. FINCH
President

[Signed] PRESTON E. JAMES
Secretary

March 30, 1938.

Titles and Abstracts of Papers Ann Arbor, Michigan, 1937*

W. L. G. JOERG.

Generalization and Synthesis in Geography.

(Presidential Address. To be published in full in the June issue.)

JOHN Q. ADAMS. (Introduced by Helen M. Strong.)

*Recent Changes in the Occupance of the Eastern Canadian Arctic:
Part I, Arctic Bay, Baffin Island.*

Arctic Bay is a new trading post located 73° 0' 8" N by 85° 0' 3" W on the north side of Adams Sound, a branch of Admiralty Inlet, Baffin Island. Arctic Bay post is on the old Eskimo route from Igloolik on Fury and Hecla Strait to Lancaster Sound north of Baffin Island where the Eskimos met and traded with British whalers long before the fur trade companies came into the eastern Arctic. As a result of this location the post will obtain furs from natives of the Igloolik area as well as its own immediate territory, Admiralty Inlet.

When the Hudson's Bay Co. established Arctic Bay post in September, 1936, nine new Eskimo families were brought in to the Admiralty Inlet territory. These newcomers originally from the eastern and southern coasts of Baffin Island were taken to Arctic Bay in order that they might supplement the game catch of the few local Eskimos in the immediate neighborhood of the new post. Presence of the necessary animals for food, clothing, and cash fur (seal, caribou, white fox) had been determined by previous investigations of the area made from the Hudson's Bay Company's original far northern post at Pond's Inlet, Baffin Island.

Arctic Bay post with its three white traders, forty Eskimos, one hundred fifty dogs, and all buildings, tents, and supplies for two years was landed and organized as a functioning unit within the space of four days, 4 P. M. September 8, to 4 P. M. September 12, 1936. The author was present during this period of construction and as a part of his field work obtained a series of still and moving pictures showing the progress of the work.

Arctic Bay post will complete the attachment of the Igloolik Eskimos to the white man's world with its new foods, tools and diseases. The hunting-sustenance culture of these people will become a commercial hunting culture and they will prosper and suffer with the fluctuations in the supply of and demand for white fox fur rather than with the abundance or scarcity of seal,

* The word ("Exhibit") at the end of an abstract denotes a showing of illustrative material in the exhibition rooms. See page 74.

walrus, and caribou. Locally, Arctic Bay post provides a necessary base for the exploitation of the Admiralty Inlet fur supply by the more civilized Eskimo migrants from southeastern Baffin Island.

If enough food and fur is obtained by the Eskimos to insure continuance of the post it is probable that within a few years a Christian mission and a Mounted Police post will be added to the new settlement.

WALLACE W. ATWOOD, SR.

The Erosion Cycle in a Rugged Mountain Region.

In the classical writings on geomorphology the principles of running water have been worked out on the basis of the sequence of events in a lowland plains country, or a low dome. The application of the principles in the interpretation of the evolution of land forms in rugged mountain regions involves the recognition of many complex structural conditions, of recurring periods of mountain growth, and of many thrilling adventures in the history of the streams.

The problem deserves much more attention than it has received in our advanced instructional work. The characteristics of peneplains in mountain areas will be analyzed and the problem of correlating peneplain surfaces in rugged mountain regions will be presented.

THOMAS F. BARTON. (Introduced by Nels A. Bengtson.)

Geographic Ecotones.

Geographers have adequately discussed as units many rapidly growing towns and cities. In an increasing number of articles, writers have also delimited portions of urban areas devoted to definite economic functions. These functional divisions, such as commercial, residential and transportation, have been treated as to importance and interdependence. Little attention, however, has been given to the description and interpretation of transitional zones between functional divisions. Although the transitional zones between functional divisions are not large, they are often a conspicuous part of the urban landscape. An attempted horizontal expansion of one functional division means a conflict with the use already established in the area. The function with the greatest economic return usually encroaches upon and replaces a less productive one. Within the zone of conflict a landscape is created representing neither of the two divisions, but, rather, representing a combination of both.

These transitional urban zones or areas vary in size. Where they are of sufficient size to be delimited because of their distinct landscape character, they become a subject for discussion. Since geographers have not coined a term for transitional zones of land utilization having distinct landscapes, the writer suggests the term "ecotone." "Ecotone" is a Greek word meaning

tension-zone or a battle front along which two forces are endeavoring to occupy the same space, but with the final result that one wins and advances over the conquered area. Plant ecologists use this word to designate the area in which a struggle is taking place between two plant formations as one tries to retain an areal space while the other fights to gain new ground by encroaching upon its occupant. In the economic battles in urban areas, the contestants are the functional areas.

The writer has mapped and delimited two geographic "ecotones" in Hastings, Nebraska, which have been named "commercial-residential ecotone" and "urban-rural ecotone." In reading research articles on urban studies, the writer believes that ecotones have existed but were not delimited and treated separately. It is his opinion that the two ecotones found in Hastings, Nebraska, are not peculiar to that city, but rather that they exist in many other cities. It is probable that the kinds of ecotones vary. It is hoped that future research studies of cities will throw more light upon the possibility and feasibility of mapping, delimiting, describing and interpreting ecotones.

LLOYD D. BLACK. (Introduced by Mark Jefferson.)

Land Use in the Willamette Valley.

The Willamette Valley of Oregon has been settled less than a century. The people are vigorous and prosperous and have a strong regional consciousness.

The author has mapped a one-mile-wide strip across the valley about ten miles south of Salem. The section is forty-four miles long and extends from the forest margin of the Coast Range to the forest margin of the Cascades. This paper proposes to discuss the land use of the Willamette Valley as illustrated by this sample strip.

The cross-section includes hop yards on the bottom lands adjacent to the river and prune orchards on the red soils of the hills, with hay and pasture areas, general farming areas, berry farms, and woodland scattered across the floor of the valley. There is a close correlation between soils, topography, and land use.

The trend is toward more intensive use of the land. A system of irrigation, now in preparation, will compensate for the dryness of the summer months. Land use problems are of three sorts:

1. Discrimination of land for forest and for farm.
2. Improvement of farm land.
3. Determination of the best use of the land on the basis of land adaptability and economic conditions.

(Exhibit.)

S. WHITTEMORE BOGGS.

American Contributions to Geographic Knowledge of the Central Pacific.

When American merchantmen in the China trade, and American whalers, first rounded Cape Horn westward into the Pacific in 1791, there were vast areas of the ocean, and many scores of islands, wholly unknown. Magellan and his successors had missed most of the island pin-points of creation. Moreover, systematic, scientific exploration had not begun until about 1760. Within the next thirty or forty years after the Americans entered the Pacific, most of the islands had been discovered and named, many of them by Americans. Their discoveries were sometimes reported in the local press and then forgotten, except when utilized by a European chart marker. Quite naturally, the nationality of the discovery was frequently omitted in the surviving literature.

One contemporary American publication, a report of 1828 published as a Congressional document, was based on original logbooks and interviews with American whalers, and shows that many of the islands unknown forty years earlier were already known to the American whalers. A recent study, based on the logbooks of 1665 American whaling voyages, plots the positions of the vessels when they took 53,877 whales in all oceans. These charts show much more concretely than might be expected that the American whalers knew nearly all the islands of the central Pacific.

Samples of guano were brought to this country in 1855, and the Guano Act of 1856 provided that unoccupied islands not in the possession of any other country might be regarded, under certain conditions, as "appertaining to the United States." A *New York Tribune* dispatch in 1859 listed about fifty American guano islands in the Pacific. That item was used in preparing an article in *Petermanns Mittheilungen*, in 1859, which designated a large area on the accompanying maps as "American Polynesia." This was followed in successive editions of the well-known *Stielers Hand-Atlas* for more than twenty-five years, and in British atlases as late as 1882.

American activities, including discoveries, assignment of names, the first accurate surveying and reporting of positions, and guano operations, constitute an impressive chapter in the historical geography of the central Pacific, which is but little known. It seems altogether probable that a systematic study of whaling logbooks, old newspapers especially in New England whaling ports, and other original sources of information, would reveal that the American contributions to geographical knowledge of the central Pacific were even more extensive than we now know.

(Exhibit.)

RALPH H. BROWN.

An Early Chapter in American Geography.

This chapter is composed from geographical observations recorded during a twenty-year period whose mid-point is approximately 1800. The locale described is coastal North America from Newfoundland and Lower Canada to Spanish East Florida. Attention is briefly called to the widely scattered source materials which possess recognizable geographic quality and validity. When assembled and interpreted, the authenticated records make possible an extended discussion in regional geography comparable in method, scope, and detail to modern geographical analyses of the same area. A plane of reference is thus provided, useful in comparative studies.

A map shows the comprehensive limits of the study and others identify the "effective areas." These limits are set by the emphasis and coverage of the synchronous observations and do not necessarily correspond with regional entities recognized at a later time. The included area delineates a seaboard province suitable for regional treatment. This province is further subdivided into regions consistent with the facts and with the length of the discussion.

The paper concludes with a survey of the salient features and problems of the effective areas during this period, especially as indicated by the authorities. This discussion is intended to be introductory to a longer treatise.

LEONARD B. CORWIN. (Introduced by C. W. Thornthwaite.)

Establishment of an Unique Climatic Study.

Early in 1937 the Soil Conservation Service in cooperation with the Muskingum Watershed Conservancy District established the Muskingum Climatic Research Center, largely by means of a federal Works Progress Administration project, to conduct a climatic study of the drainage basin of the Muskingum River.

Some of the objectives of the project were to study (1) rainfall in relation to river flood, (2) rainfall in its relation to soil erosion and to soil conservation practises, (3) rainfall in relation to crop production, (4) rainfall relationships to other climatic factors such as temperature, humidity, and wind direction and velocity, as well as its relation to the remainder of the physical landscape, particularly topography.

In order to conduct this micro-climatic study it was thought necessary to establish about 500 meteorological stations over the 8,000 square miles of the watershed. Cost was the limiting factor in determining the equipment used but Weather Bureau standards of accuracy were maintained or exceeded on all instruments.

All labor was furnished by the Works Progress Administration, all of it having no previous experience except for seven persons brought from the Soil Conservation Service Climatic project in Oklahoma. The first labor was hired on April 6, 1937, and sufficient equipment had been built and installed and observers trained to operate it so that records are considered satisfactory from July 1st. At the commencement of work workers were hired and have been trained to handle climatic data.

(Exhibit.)

ARTHUR B. COZZENS. (Introduced by Dr. Lewis F. Thomas.)

The Geographic Background of Some Mexican House Types.

For the purpose of analyzing and explaining the distribution of house types in the region easily accessible from the Pan-American Highway in Mexico, the following climatic environments were differentiated:

1. Humid tierra caliente
2. Sub-humid tierra caliente
3. Humid tierra templada
4. Humid tierra fria
5. Sub-humid tierra fria

Several characteristics, as the independent supporting of the roofs, the absence of chimneys, and the loose construction of the walls, are general in their distribution and show the influence of climate. Other features, as the size and architectural complexity of the houses, differ in the different type environments and appear to be influenced in their distribution principally by the adaptability of the available materials to certain architectural forms. In some instances other factors as the indigenous and acquired cultures of the people, give rise to local differences.

In the humid tierra caliente, bamboo, palms, and other desirable building materials are abundant. Consequently, houses commonly are large and complex. Because the thatch usually is damp, destructive fires are less frequent than in the drier areas. As a result, the houses are built for several years' occupancy instead of for temporary use.

Most of the vegetation of the sub-humid tierra caliente is not well adapted for house construction, but there is abundant adobe for the manufacture of sun-dried bricks, the principal building material. Adobe lends itself to the construction of rectangular houses which are relatively permanent. Rounded roofs and other complicated features, which in the lowlands are easy to build of bamboo, are virtually absent here, because of the lack of this plant.

The humid tierra templada furnishes abundant wood for the construction of wattle, pole and slab walls. The houses are as large and well made as those of the humid lowlands, but lack the architectural features which depend

upon bamboo. Adobe is rare on the steep slopes; therefore it is of minor importance as a building material. Some adobe is used as plaster on pole and wattle walls.

In the humid tierra fria, pine, Arizona cypress, and bunch grass are the principle building materials. Wherever bunch grass grows, thatch houses are the principal type, as they are easy to build, but where it is absent log cabins are common. The houses are built smaller and more nearly weather-tight than those at lower altitudes, to conserve body heat.

The sub-humid tierra fria is notable for its paucity of good building materials. The vegetation consists mainly of xerophytic plants, as cacti, maguey, yucca and thorny trees. Poles suitable for roof construction are scarce. Consequently, the houses are the poorest and smallest of those studied. Other causes contributing to this condition are the relatively low temperatures making heat conservation desirable, the semi-nomadic habits of the people, and the frequency of fires in the dry thatch.

(Exhibit.)

GEORGE B. CRESSEY.

The Geography of the Yenesei Valley.

The Yenesei River provides a transect across Siberia from the Sayan Mountains with their glaciers near the Mongolian border, through the steppe lands of the Minusinsk Basin, the agricultural areas along the Trans-Siberian Railway, and the extensive northern forests, to the tundras within the Arctic. Reindeer-keeping Tungusic and Mongoloid people live at both ends of the valley.

Collectivization of agriculture and large scale lumber exports from the new Arctic port of Igarka represent the chief material evidences of Soviet Socialism. Two-thirds of the taiga is made up of birch and other white-woods, the remainder of conifers. Most of the timber now being cut is along the Angara River. Mineral and hydroelectric resources await development. Continental glaciation has left thousands of lakes north of latitude 63°.

The paper is based upon field studies in each of these areas.

CHARLES M. DAVIS. (Introduced by K. C. McMurry.)

The Cities and Towns of the High Plains of Michigan.

When the lumbering industry moved into the forested area of Northern Michigan there was no preexisting structure of settlement on the land. The cities and towns which grew up during the period of exploitation by the lumbermen were oriented to the main and branch lines of the railroad net which connected the logging operations. Most of the early settlements

were located with reference to timber and milling operations and the degree to which they have prospered in the present landscapes has been due to factors probably not foreseen at the time of their establishment.

Some of the towns in the High Plains rapidly became regional centers, that is, they became focal points in the logging operations and developed wholesale and manufacturing functions which have enabled them to survive the general decline of the region as important places in spite of more or less severe population losses. Their present importance can be attributed solely to the fact that they happened in the lumbering times to build up large populations and to acquire the functions mentioned above.

The numerous smaller towns and villages scattered along the network of the lumbering railroads had only local, not regional importance and survived only as long as their trade areas remained active. In the areas where agriculture did not take over the land the small settlements were all dead by 1916 except a few along the main railroad lines. In contrast to this condition, in the agricultural districts of the High Plains in 1916 most of the smaller towns were still alive. They were the trade centers of the agricultural settlement around them. At that time the conditions of roads and horse-and-buggy transportation made necessary a number of supply points closely spaced through the farming area.

In 1935 most of these smaller villages in the agricultural parts of the High Plains had become non-functional. Automobiles and good roads had permitted the farmers to go to the larger towns for supplies and the smaller villages could not survive. The highway system which has supplanted the railroads as the underlying economic skeleton of the region has not helped the smaller towns through which it passes, because they had ceased to have any trade significance before the highways were built.

STANLEY D. DODGE.

Some Problems in the Study of the Growth and Decline of Population.

The study of the growth and decline of population on the land involves complications of methodology because of the inadequacy of data. The most complete records may be obtained in those areas where the boundaries of the census enumeration districts (towns, townships, etc.) have been longest stationary. There, changes of place name are in some cases confusing. The occasional amalgamation of towns or their separation complicate but do not confuse seriously the problem. This is true of much of the eastern part of the United States. In many western states, the enumeration districts are changed from decade to decade, making comparisons of the data of one census year with those of another impossible over periods long enough to provide a basis for analysis. An attempt has been made to obviate this

difficulty by employing the data of the population of cities and towns, rather than those of the enumeration districts. The results are far from being wholly satisfactory, but they do at least make tentative subdivisions of areas in terms of growth and decline categories possible.

EDWIN J. FOSCUE.

Influence of Contrasted Soil Types upon Land Values and Land Use.

Contrasted soil types appear in the northeastern part of Tarrant County, Texas, on each side of the line of contact between the Eagle Ford shale and the Woodbine sand formations of the Upper Cretaceous rocks. The soils that have been weathered from the shale are of a black, sticky nature, and include the Houston black clay, Houston clay, Lewisville clay, and Bell clay. These soils support a prairie grass vegetation, with scattered mesquite trees. The soils on the Woodbine, dominantly sands and sandy loams, include the Kirvin fine sandy loam, the Leaf fine sandy loam, and the Tabor fine sandy loam. These soils support a forest consisting largely of scrub post oak.

Aside from the contrasts in soil types and in vegetation, there is little difference in the physiographic environment on the two sides of the contact line. The relief of the entire area is that of a slightly dissected plain. Despite slight differences in the physical environment, land uses and land values show marked contrasts. The easily cultivated sandy soils, with their timber cover, were settled first, while the occupancy of the black waxy prairie to the east came later. At time of settlement, the sandy soils were considered the best farming lands. Later, after most of the sandy area had been occupied, the deeper phases of the black clay soils were planted in crops. Although much of the grassland, known locally as the Grapevine Prairie, is now in extensive crops, some of the shallower phases of the soil remain in native pastures.

Today, the prairie soils show a more modern development, and also a much higher assessed land value per acre, than do the sandy lands. On the prairie, the farm equipment appears modern, the houses newer, while on the older settled sandy areas, farming seems on the decline. Most farms in the sandy area, with the exception of a few specializing in poultry, appear to have passed the zenith of their development, and are in a dilapidated condition. The older farm houses, built at the end of the 19th century, show the ornate style of architecture characteristic of the late Victorian era, and invariably carry lightning rods. The homes are in need of paint, the barns in need of repair, and the farm equipment is antiquated.

This contrast in land values and land use appears in an area not more than five miles in width, that is similar in location and relief, but dissimilar in soils and vegetation. The causes for these contrasts in the cultural landscape are obvious.

OTIS W. FREEMAN.

A Geographic Reconnaissance of the Snake River Canyon.

The Snake River Canyon is among the areas of the West where pioneer conditions still persist. Here the settlers live remote from neighbors, markets, schools, stores, churches, medical attention, and many common conveniences of life. The Snake River Canyon lies south of Lewiston, Idaho, and forms the boundary of Idaho adjacent to the junction of Oregon and Washington. Mail, passengers and freight enter and leave the Snake River Canyon by gasoline launches which navigate up the river to Johnson's Bar 100 miles from Lewiston. The few roads have very steep grades and are so little improved as to be little better than trails. The canyon has been carved by the Snake to a depth of over 6000 feet into basalt flows and crystalline rock. A few men wash out a living from gold-bearing placers. Prospects for copper and gold quartz mines have not developed into productive mines. Sometimes the Snake River canyon broadens out and in such places gravel bars and flat topped terraces occur. Torrential fans mark the mouths of some tributary streams. Ranches occupy the terraces, bars, and fans, especially where a spring or stream affords water for irrigation and domestic uses. Several fairly large sheep and cattle ranches keep most of the livestock and use most of the grazing available on the rough canyon walls and canyon bottom. In addition a scant score of small ranchers make a precarious living by each having a garden, a small field of hay and grain, and a few cows. A few hundred sacks of wool and bundles of hides are the exports by the river. The cattle and lambs are generally driven to market. While men have lived in the Snake River Canyon for over 70 years little improvement in living conditions has taken place during that time.

ROBERT M. GLENDINNING. (Introduced by S. D. Dodge.)

The Simi Valley, Ventura County, California.

The Simi is a hill-bordered plain of alluvial deposition, representing the marked aggradation of an asymmetrical syncline. The essential landform components of the area are the broad valley floor, two low-lying benchland portions, and the enclosing canyon-and-ridge labyrinth of the hill zones. From about 1800 to 1890 the valley floor and the hill country were extensively utilized by a few cattle ranchers. Since then, grazing has been pushed to the hills and the valley floor has been devoted to many typically Mediterranean crops, such as citrus, apricots, and grain hays. This change has been accompanied by a more intensive land-use, smaller holdings, widespread irrigation, and the growth of an elaborate pattern of road and dwelling distribution. A well-integrated transportation system allows the ready movement of the primarily export crops to many near and distant markets.

Further elaboration of pattern is indicated for the future, but may be retarded, or terminated, by relatively insufficient irrigation water resources. Although to a degree unique, the Simi is essentially similar to many other areas of southern California which lie between the sea-border and the interior deserts.

OTTO E. GUTHE. (Introduced by C. W. Thornthwaite.)

Research in the Erosion History and Land Utilization of the Muskingum Watershed in Ohio.

The Muskingum watershed, 8,000 square miles in size, is roughly representative of a much larger part of the Upper Ohio Basin where soil erosion has been an important factor in lowering the productivity of farm lands. The Soil Conservation Service has chosen this as a desirable area for research in erosion history and land utilization. Three phases of the work are outlined.

In the first phase information is being secured from farm periodicals, newspapers and other records for an investigation of the spread of erosion, the factors involved in the development of such erosion, the success or failure of early erosion control measures, and the occurrence and extent of upstream floods.

The second phase is being conducted for the purpose of interpreting the spread of soil erosion and its relation to settlement and the development of land utilization practices. It is expected that this study will provide an evaluation of the effect of past and present trends in farm practices on the conservation of soil and the extent of flood hazards. This involves the reconstruction and interpretation of the land use pattern during periods critical to the local soil erosion and flood problems.

The third phase is a new application of the geographic approach by which an attempt is being made to correlate vegetational characteristics during given storms with the precipitation-runoff ratios of those storms in order to aid in securing indices which may be used in evaluating watershed characteristics. For these investigations there are continuous precipitation and runoff records for several minor watersheds of 700 to 900 square miles in extent.

(Exhibit.)

W. M. HANLEY. (Introduced by Glenn Trewartha.)

Land Use Types in the Lowlands of Eastern Bengal.

The areas of densest rural population in Bengal are found in the eastern lowlands where silt-laden flood waters from the distributaries of the Ganges, Bramaputra, and Meghna rivers inundate the land each year. These same meandering streams which enrich the region as a whole are constantly

at work cutting away old and often densely settled areas and building up new lands which are soon occupied by the people who have been left homeless because of the action of the shifting rivers. Within the region three distinct types of land can be classified since there is an association of forms, patterns and uses in any limited area dependent upon the length of time it has remained unaltered by the rivers.

The following types may be recognized:

1. The New Char Lands: These are islands within the stream channels or new accretions along the lower banks. They are usually sandy, unproductive areas which are not cropped and which can be seen only in the cool season when water in the streams is low.

2. The Old Char Lands: If stream channels shift and slack water permits fine silt to be deposited on the chars they become fertile and productive. Such areas are eagerly seized upon by the natives who lay out rectangular fields and build linear agglomerations of huts along the levee remnants. Fast growing plantain and fruit trees are set out around each of the hastily built homesites and crops of rice, jute, pulses, and oil seeds are planted. (This type of area is illustrated by Arigoan and Baisrasi mauzas in Faridpur District.)

3. The Older Alluvial Lands: There are many interstream areas which receive a mantle of fertile silt each year, but which have not been cut away by shifting river channels for at least several centuries. In these areas there are a number of distinctive features of land use which have developed in the course of time, though the same staple crops of rice, jute, and pulses are grown. Subdivision of holdings has resulted in a more angular field pattern; the homesites are often on raised mounds where a part of a levee has been cut away to add to the remainder; the huts of grasses and woven bamboo are usually better built and more often have roofs of corrugated iron instead of thatch; the fruit trees which surround them are fully grown and many ponds have been dug. (Suapara mauza concretely illustrates these and other aspects of older areas.)

(Exhibit.)

RICHARD HARTSHORNE.

The Tragedy of Austria-Hungary: A Post-Mortem in Political Geography.

The major event in political geography in our times was the dissolution of the political area of the Middle Danube Lands. This was a tragedy for the regions directly concerned, but perhaps also for Europe and the world.

In its physical geography the Austro-Hungarian empire was composed of a variety of regions which, with certain exceptions, could readily be

coordinated around the Middle Danube Basin, though focusing on two centers within that. With its economic core in the fertile agricultural plain, surrounded by highlands of supplementary development, and with considerable industrial development in the coal districts of the west and northwest, it could constitute a fairly harmonious economic-geographic unit. But in its cultural and historical geography it presents a picture of disunity which is a small edition of the political-geographic problem of Europe itself.

In order to transform the more or less accidentally developed territorial empire into a modern united and permanent state, the principle of nationality was not only inapplicable but directly contrary. The fate of the state depended on whether it could perceive and establish some other state-concept which could surmount the disintegrating forces and weld the divergent cultural regions into an organic whole.

The official leaders of the state were unable to establish any such concept primarily because they never clearly understood the conditions which their geographical situation imposed. The extraordinary geographic inconsistency in the history of the state long prevented them from perceiving the essential areas in which the state could hope to develop. Similar confusion of historical traditions, and special national and class interests prevented them from perceiving or accepting the only manner in which these regions could be organized into a state, namely, as a federation of largely autonomous cultural areas of free peoples. The very forces upon which the leaders of the state depended to hold it together operated against the development or acceptance of this principle. In particular, the surrender of half the empire to the Magyar landowners, under the anomalous dual form of the state, created a frozen condition from which it was extremely difficult to escape.

When this disintegrating edifice was attacked by Pan-Serbian nationalism its government led it into a trial by arms which proved to be of greater magnitude and length than it could have hoped to survive.

From the resultant ruins, five lesser structures have been built, each of which separately, and all together, inherit the fundamental problems of the older, larger structure. The new political geography of the Middle Danube Lands is as immature as the former; whether the old problems can be attacked better by new methods on the new basis remains to be seen.

(Exhibit.)

WILLIAM H. HOBBS.

Maps and Documents Which Fix the Date of the Discovery of the Antarctic Continent.

No abstract received.

BERT HUDGINS. (Introduced by W. Elmer Ekblaw.)

Tobacco Growing in Southwestern Ontario.

Since the coming of white man to the North American continent, tobacco has grown widely in the area that is now Canada. Recently the production of this crop has centered in Peninsular Ontario. Instead of being for home use only, much goes to foreign market. The interplay of geographic factors in the northern range of this crop makes a valuable study in geography.

The narrowed end of the peninsula of Ontario, opposite the Lower Straits, has much tobacco growing on its lake-bed clay soils (Miami). The heavy varieties for pipe, plug, and snuff were originally grown, but since the Great War the rapid increase in cigarette smoking has demanded a fine, light tobacco that has been carefully cured and blended. A sandy loam soil is most suitable for this type of tobacco, consequently, though the "Old Belt" of Essex and Kent Counties has continued production of the heavy tobaccos, a "New Belt" has developed in the sandy soils (Plainfield and Fox) of Norfolk and Elgin Counties which lie farther east on the shore of Lake Erie.

Though the presence of many negroes in this area, who came from the South with tobacco growing ideas, has been given as a reason for the centering of the industry in the peninsula, close investigation shows this to be not the case. The important influences in locating tobacco growing in the peninsula are geographic. The modified lake-shore climate is as important a factor here as in the well-known case of the Michigan Fruit Belt. The lake-bed clay and glacial soils are ideal for culture of varieties of tobacco; the scientific application of fertilizer enhances their value for this crop.

H. ANDREW IRELAND. (Introduced by C. Warren Thornthwaite.)

Physiographic Conditions Affecting Run-off and Soil Conservation in the Muskingum Drainage Basin of Ohio.

(No abstract received. Exhibit.)

PRESTON E. JAMES.

Population Changes in São Paulo State, Brazil.

Between the Federal Census of Brazil in 1920 and the São Paulo State census of 1934 the population of that state increased from four and a half million to six and a half million. Four areas of population increase can be identified: (1) the frontier, formerly coffee plantation, later coffee grown by small landowners, and most recently cotton grown on small farms; (2) the city of São Paulo where a considerable urban industrial growth has taken place; (3) the coastal zone near Santos where in addition to the urban increase of the port there has been an increase of banana cultivation; and (4) a small area in the Serra da Mantiquiera known as the Campos de

Jordão which is chiefly a summer resort. Most of the state, however, either actually decreased in population, or grew at a rate less than the average for the state as a whole. The old coffee plantation zone was mostly marked by declining population.

The paper is to be published in extended form in the July number of the *Geographical Review*.

MARK JEFFERSON.

Standard Seasons.

(Published in full in this issue.)

W. L. G. JOERG.

The Internal Improvement Maps (1825 to 1835) in The National Archives.

Most of the original records of the Senate from 1789 to 1929 were transferred to The National Archives in March, 1937. Included among them were maps that had in various ways been used in the deliberations of the Senate or published in its reports. They consist of about 150 manuscript items (single maps and map series) and, excluding duplicates, of nearly 600 printed maps and 50 atlases.

In a preliminary survey of this material in disarray there were noticed, first, an individual manuscript map on parchment and, second, several scattered bundles of manuscript maps drawn on cross-section paper and executed, according to the legends, by Army engineers in the 1820s and 1830s. The individual map represented the Falls of the Ohio River at Louisville, Ky., in 1807 and was finally identified as the original of a map accompanying the basic report of Albert Gallatin, then Secretary of the Treasury, dated April 4, 1808, that introduced the whole program of what came to be termed internal improvements, a program that developed into one of the major domestic activities of the nation for the next thirty years or so, or until the full development of the railroad era. (The report and map were published in *American State Papers*, Class X: Misc., Vol. 1, pp. 724-921, map facing p. 821.)

The bundles of manuscript maps on cross-section paper, when assembled, turned out to make up a continuous numbered series of 157 sheets 18 x 24 inches in size constituting surveys of belts of terrain along proposed routes for roads and canals and surveys of harbor areas. The surveys are dated from 1825 to 1835 and the localities range throughout the country from the Atlantic to the Mississippi. Investigation disclosed that these maps represent the cartographic results of the internal improvement program. In addition to their historical significance their geographical value lies in the fact that they provide intimate pictures (the scale is usually

1:63,360) of the contemporary cultural landscape and that, both of the inland areas and the coastal features, they often represent the first accurate surveys (*e.g.*, Stonington, Conn., 1827—first survey by the Coast Survey, 1839; mouth of the St. John's River, Florida, 1833, as compared with 1853 by the Coast Survey).

Among the Senate maps were also found two assembled sets—one of them bound in atlas form—of engraved versions of about two-thirds of the manuscript maps. It seems likely that the maps were engraved in order to accompany printed reports, such as the annual reports of the Secretary of War; but it has not yet been possible to identify these reports, although identification should be relatively simple. However, of the remaining third the manuscript maps are apparently the only existing version.

(Exhibit.)

HAROLD S. KEMP. (Introduced by Derwent Whittlesey.)

Environment vs. Tradition in the Balkans.

Nowhere in Europe does a minority group of environmental factors more completely succeed in handicapping a region than in the Balkan peninsula.

This is the more remarkable in that European civilization traces back to the little sea that the Balkans embrace. Not only in the arts, but in agriculture, mining, forestry, manufacturing, colonization, and city and state organization, Greece led the world. The principle of an early start should find its best exemplification here. Balkan lands could not compete today with far richer lands, but such resources as they have might be expected to have been developed in all these past centuries to their greatest capacity. Balkan populations, by now, surely should be adjusted both as to distribution and activity. But the Balkan folk are still shifting about in mass movements; local activities are in flux; naive experiments are being made, as in newly settled lands; and cities, within the present generation, have capriciously shrunk to a tenth their former size.

It is true that the focus of human affairs has shifted far from the Aegean—that the Balkans turn their back to the rest of Europe. It is true that the Danube flows in the wrong direction into a backwater; that mountain barriers face the peninsula toward the east rather than the newer west. It is true that those resources upon which present-day economic expansion is founded are lacking. But these backward countries are by no means sterile, and their eastward orientation approaches insignificance when their ultimate proximity to Europe is considered.

The geography of the Balkans is not the story of present-day coordination with the land. It is the story of tradition's hold; of a twentieth cen-

tury people who are living, in pantomime, the geography developed by ancestors centuries dead. The environment, in the days of those ancestors, was damnably designed for their undoing through the invasion of the Turks. The Turks gone, the Balkan folk still see their mountains as the barriers they were in the fifteenth century; still see the lands as fit only for the crops suited to medieval Turkish technology; still see harbors as the landing places of fresh contingents of conquerors rather than the shipping points of sellable surpluses; still see the world as a place of cruel wars which make social and economic ambition a foolish thing.

Perhaps they are right. But surely something may be accomplished between wars, if only to be torn down or blown up. There is little in the Balkans—put there in the past five hundred years—that is worth blowing up.

HENRY MADISON KENDALL.

Surface Configuration of a Portion of Belgium.

The treatment of surface configuration from a geographical point of view is often inadequate. A purely subjective method leaves as much to be desired as does one which is purely objective. The inadequacy stands out all the more sharply where there are many landscape contrasts within a small area.

The problem of description and interpretation of settlement and circulation forms in Belgium involves a thorough treatment of surface configuration. Some of the difficulties encountered when present methods are applied are here suggested for an arbitrary portion of Belgium. The area treated cuts across three recognized regions which have not been adequately handled in terms of the geographic presentation of surface configuration.

FRED B. KNIFFEN.

Notes on the Genetic Relations of Certain Louisiana House Types.

In a previous study the several house types of Louisiana were determined on the basis of morphologic comparison. Structural analyses, the study of intermediate forms, and historical inquiry as to the nature and priority of early types make it possible to advance tentative conclusions with regard to genetic relationships among several of the modern house types represented in Louisiana.

For the types considered the single log-pen appears to be the basic and fundamental unit. Its evolution into the open-passage double log-pen and its frame equivalent seems clear. Not so clear but strongly supported by the evidence is the divergent evolution of the secondary type into the so-called built-in-porch and Mid-West types.

Various oddities of perseverance, such as the double door, are pointed out.

RICHARD LOGAN. (Introduced by Wallace W. Atwood, Jr.)

Glacial History of the Housatonic Valley, Western Massachusetts.

The paper is the result of field work carried on during 1936 and 1937 under a special grant from the William Libbey Fund for Research in Physical Geography. This study is part of a detailed survey of the Housatonic Valley being conducted by the Clark University Graduate School of Geography.

Direction of striae, drumlin axes, and boulder trains indicate glacial movement was from the NW, the area having been glaciated by the eastern half of the Hudson Valley lobe.

Erosion by the ice was relatively unimportant, the present topography having been largely determined in pre-glacial times. Plucking was effective only on hills composed of jointed rocks.

Generally the forward movement continued in the ice sheet throughout its retreat across the area. Patches of frontal moraine, kames, and heads of outwash trains mark temporary halts of the ice front. These features, however, are quite discontinuous and, due to the roughness of the topography, correlation is difficult. Topographic control was pronounced during the retreat; valleys were occupied by long narrow lobes, producing a very irregular ice margin.

Occasionally large masses of ice were separated from the active glacier by the barring of a ridge. One such mass partially blocked a route of glacial outwash, and its outlines have been preserved by the gravels deposited about it. Possibly others existed but left no sizable deposits, due to the small amount of detritus they contained.

Because the trend of the ice front (NE-SW) was oblique to the general drainage lines of the region (N-S), several temporary drainage shifts occurred. In three places parts of the Housatonic drainage were diverted easterly into the Connecticut River. Later, while the main valley of the Housatonic was still blocked, meltwater drained via a more easterly tributary. After the ice left the Housatonic Valley, the westward-flowing Hudson tributaries, blocked in their lower reaches, drained eastward into the Housatonic.

LAWRENCE MARTIN.

The Constitution Sesquicentennial Map Facsimiles.

The United States Constitution Sesquicentennial Commission is publishing some 90,000 facsimiles of maps at least 150 years old. They show the thirteen States from New Hampshire to Georgia, the United States in

1782-83 and 1787. There will be sixteen State maps rather than thirteen because Maine, Kentucky, and Tennessee, although parts of Massachusetts, Virginia, and North Carolina, respectively, a century and a half ago, merit separate map treatment, as perhaps Vermont (a part of New York in 1787) will also. The second of the two United States maps will be of double size. This permits more adequate representation of the Northwest Territory, site of the present Michigan, Wisconsin, Minnesota, Illinois, Indiana, and Ohio.

The collection of facsimiles includes the best maps which were available at the time of ratification of the Constitution.

The sixteen detailed maps of the States from Maine to Tennessee show what mountains, passes, counties, cities, towns, villages, white settlements, Indian communities, forts, post roads, trails, paths, projected canals, bridges, portages, ferries, fords, shoals, reefs, ports, ship anchorages, and natural resources existed and were known in 1787. They give the locations of more than a few iron mines, lead mines, salt licks, freestone quarries, coal mines, forests, oyster beds, lakes, swamps, rivers, falls, rapids, waterpowers, furnaces, forges, glasshouses, mills (including slit mills) churches and meeting houses. (Eight of the maps are reproduced in connection with the item on exhibits, pp. 74-75.)

The maps are executed in colors on sheets 16 by 20. They will be sold for ten cents a sheet. The plan of having these facsimiles was not made until October 11. Four weeks later nine of the maps were in press. The series could not have been brought out within the Sesquicentennial year, and the facsimiles could not have been so faithful to the originals, or supplied at so nominal a cost, if there had been no rich map collection at the Library of Congress and no competent and up-to-date reproduction plant at the United States Geological Survey.

(Exhibit only.)

RAYMOND E. MURPHY.

The Anthracite Landscape.

In eastern Pennsylvania there are several northeast-southwest trending belts where coal is the keynote of the landscape. Here more than 98% of the country's anthracite is produced and here, largely because of the presence of this resource, a million persons make their homes.

Crowding is very great. Population density averages 2,000 per square mile, and most of these people are confined to the floors of synclinal valleys where they must share the limited space with an industry that requires a large area for its giant breakers and for a variety of mine structures as well as for huge piles of waste. Winding and twisting between the culm piles

and rock banks lie the railroads which are strikingly extensive and constitute a particularly vital element of the picture since they carry a large part of the anthracite to market. Blackened floodplains border many of the streams and stretch dark fingers beyond the region's rims. There are occasional stripping operations which form great gashes in the valley sides, exposing bright red or yellow clay. Uneven highways and occasional houses tilted at odd angles testify to the common occurrence of surface subsidence. Recently hundreds of "bootleg" mines have appeared here and there wherever coal occurs near enough to the surface to be easily mined, and trucks loaded with "bootleg" anthracite add to the congestion of the highways.

In the anthracite towns lives a strange mixture of peoples. To the original English and Scotch have been added the Welsh and Irish and more recently people from eastern and southern Europe. These successive waves of immigration have been responsible for a remarkable confusion of languages, religions, and social customs. Interest in the anthracite industry is everywhere paramount, but textile and textile products plants also play a prominent rôle in the economy of most of the towns.

The Anthracite Region is commonly subdivided into four fields—the Northern, Eastern Middle, Western Middle, and Southern—and these show minor variations from the described pattern, variations that are based upon differences in the degree of folding of the underlying coal seams. These same conditions account for differences in the quantity of reserves of the several fields.

The present pattern betrays elements of instability. Any mineral resource is subject to exhaustion, and there are sections of the Anthracite Region that are approaching the end of their mining existence. Since many of the manufacturing industries are parasitic upon mining they too may be short-lived. Within recent years competition with other fuels has brought a premature decadence to the region, which may result in spreading over a period of years the readjustments that are inevitable in view of the approaching decline of the region's greatest resource.

A. RUSSELL OLIVER. (Introduced by Howard E. Simpson.)

Land Utilization in Judith Basin, Montana.

Mountain-girt Judith Basin, famous originally for cattle grazing, more recently for wheat raising, lies almost in the geographical center of Montana. In topography, vegetation, and soil it differs only slightly from remainder of the Great Plains. Climatic differences are more significant, Judith Basin receiving from two to three inches more precipitation, both annually and seasonally, than the neighboring plains.

Three periods comprise the history of land utilization in Judith Basin, *vis.*, hunting-trapping to 1880, stock grazing from 1880 to 1905, and wheat

raising since 1905. The earlier two periods were characterized by man's use of resources of the region as he found them without any attempt to improve upon them. The third period was marked by an attempt to improve upon nature. The two later periods were characterized by destructive exploitation of two great resources—grass and soil.

Stock grazing was handicapped by excessively severe winters and summer droughts, singly or in combination, which, on the average, caused heavy losses one year of every five. From 1880 to 1897 cattle were more important, while sheep ranked first in importance from 1897 to 1906.

Strictly commercial, mechanized wheat farming began in 1904, and a wheat boom prevailed from 1908 to 1916. Conditions in the Basin favorable to such a boom were above-normal rainfall, exceptionally fertile virgin soil, excellent railway transportation, and cheap land. Inflation and prosperity resulted. The boom was broken by three years of severe drought, 1917 to 1919 inclusive, followed by general economic depression from 1920 to 1923. Recovery began in 1924, and, in response to favorable climatic conditions and good prices for wheat, a secondary boom, lasting until 1930, developed. Drought and economic depression beginning in 1929-30 brought ruin once more.

Today, in addition to strictly economic problems, the Basin faces two major problems of geographic nature. Long continued drought, unbroken since 1930, has resulted in disastrous shortage of soil moisture and of water for human and livestock consumption. Some sections are, or soon will be, uninhabitable for lack of water. Soil blowing, due to drought and improper cultivation, has destroyed soil over extensive areas and elsewhere has seriously reduced its productivity. Land abandonment, a result of plowing up soil originally unfit for cultivation, and of soil destruction and decreasing productivity caused by soil blowing, is going on at an increasing pace. Extensive acreages lie unused, growing up to weeds.

Judith Basin is properly a stock-ranch, cash-grain farming area. Despite unfavorable conditions, introduction of crested wheat grass, reduction of wheat acreage by at least 50%, and proper tillage methods and crop rotations will enable it to continue as such.

ROBT. S. PLATT.

Items in the Regional Geography of Panamá.

(Published in full in this issue. Exhibit.)

J. R. RANDALL. (Introduced by J. R. Whitaker.)

Agglomerated Settlements of the Nittany Valley, Pennsylvania.

The Nittany Valley of Pennsylvania is the largest of the limestone lowlands between the Great Valley and the Allegheny Front. The term Nit-

tany as used here designates the valley of that name and also all those that are continuous with and structurally related to it. This composite valley is about 95 miles long and from two to ten miles wide.

The agglomerated settlements of the Valley are small but numerous. Their distribution is irregular but orderly when considered in relation to the natural features—surface configuration, drainage, and soils—that were so important at the time of founding. These three sets of features account for the sites of a majority of the settlements. The patterns of the agglomerated settlements are relatively simple. Seven are recognized: rectangular, cross-shaped, Y-shaped, linear, T-shaped, L-shaped, and irregular. Only the towns and a few of the larger villages have rectangular patterns. The irregular pattern is associated only with iron workings. The other types of patterns are all closely related to highways. Of these the linear is the most common.

The agglomerated settlements of the Valley have not been different in their process of development from those of similar valleys in the Ridge and Valley region of Pennsylvania. The majority of them were founded before 1830, and developed aspects of close settlement after the construction of roads. The iron industry, almost as much and as early as farming, exerted an influence on the development and growth of the settlements. Canals and railroads later affected their growth. Changes in the factors influencing the growth of the agglomerated settlements are reflected in the increase and decrease of population. Settlements entirely dependent on the iron industry are decadent or have disappeared. A number of agricultural settlements are static or have shown a slight decrease in population, a result largely of agricultural conditions. Other settlements have increased, though slightly, because of the development of small manufacturing plants, the growth of extractive industries, or the productivity of the local agriculture.

As a group the agglomerated settlements of the Valleys are old, small, and rural. From present indications they are likely to remain small.

(Exhibit.)

W. A. ROCKIE. (Introduced by Nels A. Bengtson.)

Man's Effects on the Palouse.

The Palouse was originally prairie, with scattered brush and trees on the sheltered slopes. It was well watered and had numerous small permanent flowing streams. In its virgin condition, it must have been a "big game Heaven." It must also have presented a tremendous fire hazard in the dry season. It probably was included within the Indians' summer habitat.

About the beginning of the nineteenth century, explorations were made repeatedly through this area by representatives of different nations, each in

the hope of claiming it for his country. By the middle of the century, this had resolved itself into a rather concerted plan on the part of the United States which involved scattered settlements officially recognized. In the sixties, gold was found at various points adjoining but generally mountainward from the Palouse, and this was followed by the beginning of scattered stock grazing. By 1870 cultivation was getting well under way, and by 1880 nearly all lands had been taken by homestead or by timber claim. Cultivation continued to spread higher and higher over the hills until practically no acres on any farm remained uncultivated. That custom has prevailed until in 1930 this area probably had as large a percentage of tillable land actually in cultivation as any area of farm land of equal acreage anywhere in the United States. This was in spite of the fact that it is one of the most unfavorable physiographic areas in the country from the standpoint of cultivation.

Under the original grass cover of this land, the rain fell, soaked in, and seeped out into the streams. Under the present usage of land, the rain falls, and a large part of it escapes as muddy runoff. In short, the uplands are eroding at a much accelerated rate. Again, under the virgin conditions, the winter snows lay in the tall standing grass with some snow drifting but seldom were areas bare of snow. Under the present clean cultivation, probably 50 per cent of the snowfall on a given farm piles up in drifts of excessive depths leaving 30, 40, or 50 per cent of exposed uplands entirely bare of snow. Only the sheltered lowlands retain anywhere near their normal snow cover under present use of the land.

These and other changes in the use of this land are effecting very definite economic trends and results which do not promise well for permanently retaining this land in agricultural use.

Is it going to be possible to so modify the agricultural practices in this area as to change its life from one of very temporary character to that of a permanent agricultural area?

VICTOR ROTERUS. (Introduced by Charles C. Colby.)

Some Manufacturing Economies of East Tennessee as Reflected in Knoxville.

In Knoxville, centrally located in the Valley of East Tennessee, are reflected most of the prevailing manufacturing economies of the area surrounding it.

Regional peculiarities of labor, resources, and market are mirrored in the manufacturing of Knoxville. The dominant position of textiles is based primarily on the labor factor. Intra-areal differences are apparent in this industry, and are due, in part, to rural-urban differences with respect to

labor skills and costs, taxation policies, and plant mobility. The natural resource factor accounts for similarities in the manufacturing of Knoxville and its surrounding areas as well as for contrasts. Certain market peculiarities of the area are reflected by industries manufacturing machinery for mining localities, mill supplies for rural grist mill operations, and some chemicals to supply the textile industry. For the agricultural industry of the area, however, Knoxville acts more in the capacity of a distributor than a manufacturer.

Classifying the employment of each plant in Knoxville and East Tennessee according to the essential regional competitive advantage of the plant reveals that a favorable wage differential is by far the most important competitive advantage possessed by the manufacturing plants in this area. In Knoxville, 47.5% of the manufactural employment is in plants that possess a labor advantage alone. Another 14.6% is in plants that possess this advantage in combination with other regional advantages. Among the implications of this classification is the significance of national wages and hours legislation to Knoxville and East Tennessee.

(Exhibit.)

JOSEPH A. RUSSELL. (Introduced by K. C. McMurry.)

Delta County, Michigan. Geographical Description Applied to a Political Unit.

Complexity and contrast, chiefly attributable to the location of Delta County in the path of the Wisconsin glacier (Pleistocene) have marked the surface, soil, and vegetation of this area from the time the last ice sheet withdrew.

The deep north-south trench of the White Fish-Autrain depression seems to cleave Delta County into two parts essentially dissimilar in cultural and natural features.

The fundamental arrangement of the natural landscape elements of this county is inherited from the glacier, but the specific types of these elements are reflections of post-glacial climates which have exercised a selective influence in determining what types of soil and vegetation have developed, while post-glacial lakes have modified the surface features in a portion of the county.

The area falls within Köppen's Dfb climatic zone, and this factor is reflected in the podzol soils and the birch, beech, maple, and hemlock vegetation association found in a native state on the well drained uplands. White, Norway, and jack pine were found in homogeneous stands on soils too dry to support hardwoods, while cedar, spruce, balsam, and tamarack were usually found in poorly drained areas.

The first human inhabitants were Indians. The native dwellers of the forest were soon superseded by the white man, who came originally in search of furs and to spread his religion. The stands of soft woods desired in the more populous regions to the east and south soon attracted the major share of the white man's attention, and lumbering quickly depleted most of the native growth. Fire followed the lumberman and completed the clearing of the land. New elements were added to the evolution through which the vegetation was passing, and vegetation patterns were changed from those which had existed before the white man first entered the region.

Agriculture and urbanism developed as a corollary of lumbering. Despite the transient nature of lumbering itself, agriculture has persisted, although agricultural patterns of today are different from those of the lumbering days. The major agriculture, hay and dairying, is concentrated in the western half of the county, while during the heyday of lumbering, agriculture was practiced wherever a lumber camp or a mill town insured a ready market. The two major cities of the present were not dependent upon lumbering for their original settlement. Commercial, wholesale, and transportation functions support them.

Despite the fact that no degree of regionality is proved for this study, it is impossible to go into Delta County without recognizing that the area is made up of a number of landscapes which are dependent for their differentiation on three phenomena, listed in their order of importance in affecting the aspect of the present day landscapes: glaciers and glacial lakes, post-glacial climates, and man.

R. J. RUSSELL.

Louisiana Stream Patterns.

The meandering streams of Louisiana floodplains present pattern characteristics that practically stamp out the distribution of the State's most significant geographical forms. The patterns depend upon such things as stream widths and effective stage differences. Each major stream tends to exhibit its own particular pattern, a fact that readily leads to the identification of abandoned channels, even though they now lie on delta or terrace surfaces well above floodplain levels. Dominant among the landforms are the natural levees of meandering streams. Soils are distributed chiefly along belts determined by the levees. As barriers, the levees determine many minor stream patterns, such as the dendritic drainage leading from the interior land of "points" to the lowlands of back-swamp or marsh. Toward the coast, tidal channels present patterns quite unlike those of streams draining the interior. To some extent, particularly as regards visibility and frequency of frost, climatic patterns follow the levees. Vegeta-

tional distribution and animal life are still more closely related to levees and stream patterns. Forms of the cultural landscape reflect drainage patterns to such an extent that practically all towns, roads, and agricultural lands are located on levees in the lower parts of the State. Social standing to some extent depends upon which side of a river bend a man's property is located, as does the value of land, and even such things as the antiquity of landmarks. Watercourses themselves serve for navigation, fishing, oyster culture, and various other activities. A surprising relationship exists between cultural landscapes and even the abandoned drainage features of uplifted surfaces.

E. M. SCOTT and ROBERT FINLEY. (Introduced by Glenn T. Trewartha.)

A Great Lakes to Gulf Profile of Dispersed Dwelling Types.

A quantitative study of the dispersed dwellings along a 1,640-mile automobile traverse from Madison, Wisconsin, to Beaumont, Texas, crossing Illinois, Missouri, Arkansas, and Oklahoma. Ten significant facts about each of 3,469 dwellings observable from the highway were recorded. These data are summarized and the house types are classified on the basis of ground plan and form of roof; sub-types are distinguished by consideration of size and orientation with respect to the road. Twenty-four types or sub-types are recognized and some of the more dominant ones are sketched and their distributions expressed graphically. The explanation of these distributions is not attempted in this paper.

A considerable degree of regionalism in the types of rural houses is demonstrated. There are also distinct regional contrasts in roofing materials, kinds of foundations, proportion of painted houses, and quality.

(Exhibit.)

GUY-HAROLD SMITH.

The Morphometry of Landscape: An Analysis of Slope.

The configuration of the terrain is susceptible to several analytical techniques, but not until the surveyor gave geographical science the topographic map was it possible to express the elements of the terrain in quantitative terms. The complexity of the terrain has made analysis of all features extremely difficult and laborious. Elevation and position, the most easily discernible from the map, have been exploited most. Slope has long been recognized as a significant element of the terrain both by the agriculturist and the geomorphologist. Techniques for the quantitative analysis of the slope of the land have been devised by Penck, Rich, and Wentworth, but it seems that they have not been applied to any except sample areas. Wentworth's method with slight modifications can be applied to large or small

areas so that surface configuration can be resolved into quantitative values for slope which can be correlated with economic and social data now available.

(Exhibit.)

HENRY S. STERLING. (Introduced by Glenn T. Trewartha.)

Agricultural-Village Morphology in the Valley of Mexico.

A six-months reconnaissance field study of the rural land and occupation features of the Valley of Mexico, just completed, has revealed, among other things, certain morphologic features of the agricultural village, the predominant type of rural settlement.

The valley is an upland bolson basin quite representative, in its occupation forms, of Mexico's Central Plateau as a whole. Over 3000 square miles in extent, it presents varied types of fundaments reflecting primarily differences in drainage, slope, altitude, and exposure to prevailing winds. Of the more than 300 agricultural villages which it supports, ranging in size from less than 50 to several thousand people, over two-thirds are concentrated on the better drained portions of the valley floor.

In general, villages are rather uniform in their semi-compact house clusters, each surrounded by its communal and private lands, and in their amorphous outline and largely one-story profile. They display three generally distributed variants of basic house form, and a number of minor or local ones. House materials vary even more widely, being, as a rule, those locally available. Houses are spaced at intervals along narrow streets or lanes which, unpaved save on steeper slopes, usually form an irregular pattern, sometimes oriented roughly to a central plaza, church, or road.

Just as village environment, tradition, function and land use assume various aspects in different parts of the valley, so the village itself displays certain morphologic contrasts as well. Various examples are noted, including several from the writer's detailed field studies of representative villages in certain type locations.

(Exhibit.)

H. THOMPSON STRAW. (Introduced by Preston E. James.)

The Phosphate Industry of Tennessee.

There are three varieties of phosphate in Tennessee: the white, a secondary deposit of post-Tertiary age; the blue, a bedded deposit of late Devonian or early Mississippian age; and the brown, a residual deposit of Ordovician age. The first two varieties are in the Western Highland Rim of Tennessee, whereas the last is located in the western part of the Nashville Basin. Of all these deposits, the brown is by far the most important.

There are many ways of treating phosphate rock to form a product suitable for fertilizer. The latest one, which is creating a radical change in the industry, is the electric-furnace process developed by the United States Bureau of Soils and the Tennessee Valley Authority. By it pure phosphoric acid is made which is used to produce triple phosphate, a product which contains more than twice as much available plant food as most of the older forms of fertilizers produced from rock phosphate. The results of experiments carried on by the Tennessee Valley Authority point to even greater concentration of available plant food. The two principal results of this method will be the reduction of freight costs of the finished product and the practical increase of phosphate rock reserves, since poorer grades of rock can be used than could be by former methods.

The presence of the phosphate industry has produced numerous changes in the surrounding area. This is especially true in the Nashville Basin where rural settlement of considerable density preceded the mining activities. Some of these changes are obvious, such as the increase of idle land in the form of mine dumps, which generally have too rough a surface even for grazing, and the shift in population distribution due to the settlement of workers near the mines. Other changes are less obvious. The mines have given the area a better balanced economy than it would otherwise have and permit a denser population than could probably be supported by agriculture alone. Perhaps the most far-reaching change is in the cropping system. Prior to phosphate mining the dominant crops were cotton and corn. With the draining of labor away from the farms has come less dependence upon clean-cultivated crops, greater diversification and dependence upon livestock.

It is to be expected that the electric-furnace method which bids fair to be so successful in Tennessee will be used also in the richer and far more extensive deposits of the Western States. Heretofore these deposits have given those of eastern United States but little competition owing to the cost of the long freight haul to markets which are in eastern and southern United States. The manufacture by this new method of a relatively concentrated product, however, may enable the Western deposits to compete. Therefore, what is now producing a boom in the Tennessee phosphate region may in the future lead to its decline.

HELEN M. STRONG.

A Land Use Record.

The blackland prairies of Texas are characterized by a slightly undulating land surface of long gentle slopes, except along streams where slopes are shorter and steeper. Thick, heavy native grass—largely bluestems and

some grama, with short grass or buffalo grass in some places—covered the region originally, except for some trees along drainages.

Houston soils extend over the larger part of the blackland prairies, among which the Houston black clay is by far the most important, and dominates the region. The A horizon, or fertile productive surface layer of this soil is 12 to 20 inches in depth and consists of black calcareous clay, originally high in organic content. This grades into the B horizon, which is a light-colored heavy calcareous dark gray clay, through which water penetrates only slightly. Under this, at a depth ranging from three to five feet, this material grades into the C horizon composed of a yellowish or yellowish-brown marl, or into a soft chalk or chalky marl. Agriculture in the area was founded and developed on the high fertility of the surface black layer of the Houston black clay.

By 1850 population had begun to spread, but only sparsely, over the blackland prairies. Settlement was accelerated with the coming of railroads in 1870. Early agriculture was devoted to cattle ranching, with only a little cultivation along stream bottoms. Wire fencing encouraged division of the land into fields. Cotton became the principal cash crop. With this clean tilled crop, planted up and down the hills over large areas, the ground was devoid of any protective grass cover, and sheet wash, then gullying carried away the fertile black top soil from large areas all over the blacklands. The unproductive heavy clay subsoil, or B horizon, was exposed. Much land was abandoned to crops, owing to declining yields, and it grew up to weedy pasture of little value for cattle feeding.

The history of a farm near Garland, Texas, is typical. It was put into cultivation in 1876. The farmer was compelled to cultivate the steeper slopes where grass grew more thinly than on the gently rolling uplands, because he had only two mules which did not provide sufficient power to break the heavy sod of the upland more level area. Five years later these uplands were broken, requiring eight oxen for the task, but not until the land was ploughed again the second year was it in condition for planting. Cotton made a bale to the acre during the first year or two, but yields declined until 1900 when the land was abandoned for crops. For nearly 40 years it remained idle, until September, 1937, when it was sodded to Bermuda grass for permanent pasture, for it was so badly gullied and washed that only by reseeding could a grass cover be established again.

Across the fence from this badly gullied field is one which has been kept in native grass for grazing work stock, and it is as smooth as when the country was settled nearly 100 years ago.

Many of the fields in this region are being put into pasture. With regulated grazing, the grass cover can be maintained to sustain a cattle industry,

which along with cotton, would provide a cash income to the blackland farmer.

C. W. THORNWAITE.

Geographical Research in the Soil Conservation Service.

This paper discusses the organization of the Section of Climatic and Physiographic Research of the Soil Conservation Service and outlines the outstanding recent achievements of interest to geographers.

GLENN T. TREWARTHA.

The Driftless Cuestaform Hill Region: Early French Settlements.

This is the first episode of what is planned to be a much more comprehensive study of population and settlement within that contiguous unit of hill land in the Upper Mississippi Valley, known world wide as The Driftless Area.

When Joliet and Marquette, traveling by way of the Fox-Wisconsin portage route reached the Mississippi in 1673 the era of white settlement in the Driftless Area was begun. Three-quarters of a century of French control in the region left only an insignificant imprint of observable features. Furs were the dominant attraction to Frenchmen coming to the area and serious reduction in the number of fur-bearing animals and modifications in the Indians' method of living as a result of increasing dependence upon the white man's goods, were two of the principal marks of French exploitation. French tenure of a sedentary character existed in the form of a series of far-flung riverside fur-trading posts. At least twelve such stockaded forts were established during the period of French control. With one exception they were all on, or very close to, the Mississippi which was the principal route of travel. At two of the twelve, mineral exploitation was a significant incentive for establishing the fort. In general appearance they all were probably much alike. The principal natural route between French Canada and the Upper Mississippi posts was by way of the Fox-Wisconsin rivers. All of the French forts have so entirely disappeared that even some of their sites are not known with certainty.

(Exhibit.)

EDWARD ULLMAN. (Introduced by Derwent Whittlesey.)

The Zonal Impress of the Eastern Rhode Island-Massachusetts Boundary.

A State line is visible to some extent in the settlement pattern of an area. On examination of a specific line, some evidences of a direct impress were found but in most places no apparent influence could be detected;

when, however, there was substituted the hypothesis that a State line might also cause a gradual change in the occupance pattern, as opposed to a sharp line of cleavage, more examples of boundary effect were discovered.

In the vicinity of two large cities of the area, Pawtucket and Fall River, where settlement is close, the most significant adjustments occur. A variety of features are affected. Direct impress, for example, is shown by the location of factories in one State or municipality to take advantage of lenient laws and low taxes. Examples of some types of zonal impress are:

1. A zone of slums astride the boundary reflects low grade development on one side; laxer law enforcement in one municipality and State is responsible for such features as saloons, which lower the tone of the whole neighborhood.
2. In several places commuters' houses stop near but not at the State line. The houses extend a walking distance beyond the termini of street-car and bus lines ended by the State line.
3. A paved road is ended by the boundary but a 50-foot makeshift, gravel extension has been added to carry the road a short distance beyond the line.
4. At many places public utilities such as water, sewer, and electricity extend short distances across the line from their home municipalities.

There is apparently no zone of tax change; that is, the assessed valuation on property in one State does not influence the assessed valuation on property in the other State just across the line. Retail gasoline prices, however, do not change at the State line in response to changes in tax; the cheaper price extends up to two miles into the neighboring State.

The boundary zone illustrated by these examples apparently represents the actual areal compromise between the ideal of no boundary and the establishment of a State line which is not so strong legally as to effect a sharp break in the occupance pattern.

WILLIAM VAN ROYEN. (Introduced by Nels A. Bengtson.)

The Cibao of Santo Domingo.

The Cibao, the plains region located between the Cordillera Setentrional and the Cordillera Central is physiographically not homogeneous. The bedrock is young, mostly from Miocene to Recent, and the region owes its existence to extensive faulting and folding during the Pliocene. The present surface features are probably all of from Upper Pliocene to recent age. The south front of the Cordillera Setentrional is quite straight, but the north front of the Cordillera Central is irregular, especially east of Rincon. The real lowland area of the Western Cibao is the floodplain of the Yaque del Norte, narrow at Santiago and widening into an extensive

delta region below Guayubin. The central part of the Eastern Cibao is a former extension of Samana Bay, wide in the west, narrow near Villa Rivas, and filled in by rather recent deposits. To the north of these lowlands lies a series of terraces and the foothills of the northern mountains. The region from Santiago to Moca, between Western and Eastern Cibao consists of a high, little dissected terrace level. The southern part of the Western Cibao consists of the level to rolling plains of Sabaneta and the highly dissected Tertiary hills. The Eastern Cibao is bounded to the south by the lowest portion of the Cordillera Central and the dissected limestone plateau of Cevicos. Climatically there is a sharp difference between the Western and Eastern Cibao: the former is from sub-humid to semi-arid, the latter is a distinctly humid region. This difference is expressed in soils, natural vegetation, crops and density of population. The Western Cibao is largely a grazing area, especially on the terraces and the Sabaneta plains. Both non-irrigation and irrigation agriculture are practiced. The principal crops are cassava, plantains, corn, and rice with tobacco in the eastern part. In the Tertiary hills much of the land is in excessive slopes. East of Licey Media cacao and coffee begin to appear. The richest land of the Eastern Cibao is formed by the deep black soils of the Eastern terrace and foothill region. This relatively small area constitutes the true Vega Real, the most densely populated part of the Dominican Republic. The more gravelly terraces are occupied by savannas. The low part of the Eastern Cibao is underlain by heavy yellow clays, and is largely in grass. Except in the floodplains the land has not proven suitable for the principal tropical cash crops. The limestone plateau of Cevicos is practically uninhabited, as is the delta of the Yuna River.

J. O. VEATCH.

A Procedure for Rapid Land Classification.

A prescription for making maps of land classification, illustrated with samples.

(Exhibit only.)

STEPHEN S. VISHNER.

Causes and Consequences of Indiana's Regional Contrasts in Rainfall Intensity.

Intensity of fall critically affects rainfall utility. It has been little studied partly because its analysis requires much labor, and also partly because it was not realized that significant local contrasts in intensity exist in lowlands remote from mountains or sea.

A study of Indiana's regional contrasts was made partly to discover if similar studies of other areas might be justified. Although Indiana is a

small inland State with little contrast in elevation, analysis of the official data in many ways (partly enumerated in *Ann. Assn. Amer. Geogrs.*, Vol. 27 (1937), p. 122) shows that marked southward increases in rainfall intensity exist especially during the cooler months. Southern Indiana has several to many times as many rainstorms of specified duration and intensity as has northern Indiana.

Six geographic influences cooperate to produce these contrasts, namely differences in latitude, in distance from the great source of moisture, in elevation, in topography, in effects of Lake Michigan, and in location with respect to the "paths" followed by air masses both cyclonic and polar-tropical. Although the Indiana contrasts in each of these factors are only moderate, they work together to produce noteworthy climatic differences.

An analysis of soil erosion indicated that upon comparable slopes, surfaces, and soils, erosion is decidedly more rapid and extensive in southern than in northern Indiana. An appreciable part of this difference presumably is due to the difference in the amount and intensity of the rainfall.

The greater average ruggedness in southern than in northern Indiana apparently is partly a result of the differences in the rate of erosion associated with differences in rainfall.

The decidedly lower average crop yields upon comparable slopes in southern than in northern Indiana apparently are also related to the more unfavorable rainfall distribution. In the south a much smaller percentage of the rainfall is useful to the crops.

Largely as a result of the poorer crop yields associated with the drier and poorer soil, there are noteworthy regional contrasts in the percentage of the land in farms and crops.

The comparative poverty and backwardness of the average family of southern Indiana seemingly is, therefore, basically related to the less desirable rainfall distribution.

(Exhibit.)

DERWENT WHITTLESEY.

The Mediterranean—mare liberum or mare clausum?

The age-old question of a free *vs.* a closed sea has been discussed from legalistic and historical viewpoints. Like most perennial problems of politics, it has an environmental basis, recognized by a number of writers, but not heretofore studied critically. In recent years the question has leaped into the political limelight in the Mediterranean Sea.

The doctrine of the closed sea originated in the Mediterranean, where pouch-shape bays of all sizes are common and have tempted maritime states from earliest history to close off such waters as their puissance permitted.

At narrows landpower has traditionally disputed the right of control with seapower. Rome, originally a landpower, was the first state to make itself amphibian and to control the whole Mediterranean. Pirates have perennially operated in well-defined areas to threaten free navigation. Their acts are akin to wartime procedures of the present day.

The great debate on the *mare clausum* grew out of claims of quasi-Mediterranean Spain and Portugal to extend a Mediterranean concept to the open oceans. The controversy established the freedom of all large seas and at the same time conferred upon riparian states varying degrees of sovereignty over coastal waters. This opened the Mediterranean and its larger alcoves, but closed many of its smaller bays and some straits. The status of narrows hinges upon political control of opposite shores. Steam navigation fostered the Suez Canal, which not only added one more Mediterranean strait, but also converted the sea itself from a pouch to a gut.

The issue of freedom of navigation has forged to the fore with the rise of Italy as a major power, and with new weapons—the submarine, the airplane, and the long-range gun. Italy claims special prerogatives because it has no ocean frontage. Opposed are the shipping nations, headed by Great Britain, with commercial and political reasons for keeping the Mediterranean a free sea. The present distribution of Italian and British force within the area presents evidence which the geographer will accept as an indication of geo-political reality. (To this topic nearly half the paper is devoted.)

The legality of a limit to territorial sovereignty has not expressly been challenged, and legal sanctions reinforced by three centuries of international usage have weight in the balance of forces. Nevertheless, they tend to conform to the stresses of political power. Italy, like its predecessors on the central peninsula of the Mediterranean, is unmistakably interested in political closure of the circumscribed waters which have always nurtured the concept of *mare nostrum*.

LEONARD S. WILSON. (Introduced by L. M. Gould.)

Faribault, Minnesota.

Faribault, near the center of Rice County, is representative of the smaller county seats of the States of Minnesota, Wisconsin, and Iowa.

The site of the city is the alluvial deposit formed at the junction of the Straight and Cannon Rivers. Both streams show the characteristics of small rivers in a glacial terrain. The original vegetation, known as the "Big Woods," has been almost completely removed so that only small sections remain. It was composed of oak, maple, black walnut, and cedar and formed one of the early attractions for settlement, because wood, combined

with water power available on the two streams, made a lumber center of considerable local importance.

The site was first occupied by a band of Sioux Indians. During the pioneer stage, they traded with Fort Snelling at the junction of the Minnesota and Mississippi Rivers. Being close to the border of the Big Woods and the Prairies, the natives had the advantage of three natural facilities: the river, the forest, and the plains.

Europeans visited the vicinity in 1768, when Lt. Jonathon Carver passed through the area in search of the Northwest Passage. About 1853, Alexander Faribault arrived at the junction of the rivers. He set up a trading post. The trader saw the advantages of the site and almost immediately filed claim to the land. In 1854 he laid out the original plot of the city. From the beginning Faribault was a manufacturing town. In 1857 there were several lumber mills, grist mills, and barrel factories in operation. During this time transportation was a vital problem. Fortunately, the railroad reached the city from Minneapolis in 1865. During this same year a second addition to the function of Faribault in the territory was made, the establishment of St. Mary's and later the Shattuck schools.

Growth along these lines has continued. Faribault has a population of 12,767. Many of the mills persist, but by far the greatest function of the city is its rôle as a county seat. This is borne out by the comparatively small umland which surrounds the city. Its manufacturing enterprises serve a larger area than the immediate trade area. The umland varies greatly with the seasons. A survey of the trade area indicates that the small centers play a more important rôle during the winter than does Faribault, which serves as a distributing center for its satellite centers as the city itself serves as a satellite of Minneapolis and St. Paul.

ALFRED J. WRIGHT. (Introduced by K. C. McMurry.)

Manufacturing Districts of the United States.

The manufacturing districts of the United States have been delineated upon the basis of all factors of production. The use of value added by manufacturing as a base reveals a distribution of this phenomenon, many of whose essential features differ from the distribution as worked by de Geer, Hartshorne, and the Census.

(Exhibit.)

CLIFFORD M. ZIERER.

Can Tasmania Retain Her Population?

An important outward movement of population has been characteristic of Tasmania from the beginning of settlement. The momentum of that

movement has increased notably in recent decades and net migration has been represented by annual losses in three-fourths of the years since 1900. In numerous years, especially since the World War, total population in Tasmania has shown declines.

Several combinations of external and internal conditions have encouraged population exodus at different periods. Unsatisfactory economic and social conditions arising from the transportation of more than 67,000 convicts from England during the period 1803-1852 was one of the most important early causes. Shortage of good land and an unsatisfactory system of land distribution also led to population losses. The development of gold mining and of competing agricultural industries on the mainland were other reasons for migration.

With the establishment of the Commonwealth in 1901, new and powerful forces began further to draw the youth of Tasmania to the mainland. The adoption of uniform tariff regulations throughout the Commonwealth further weakened Tasmania's hold on mainland markets. Large-scale manufacturing plants in mainland cities, developed under protective tariffs, destroyed the small plants in outlying centers. Increased costs of shipping under the Commonwealth Navigation Act added to Tasmania's burden.

Several developments in Tasmania, however, based on a more effective utilization of resources, are giving a firmer hold on population. First, specialized agriculture, centering about apple, potato, and small fruit production, along with dairying, is better suited to the Tasmanian environment than is wheat and wool production. The shift to intensive farming is being encouraged by various agencies and the movement is much in evidence. Second, the recent rapid development by the State of hydroelectric power has enabled Tasmania to secure large, new industrial plants and to modernize transportation and housing conditions. A large electrolytic zinc plant, carbide works, fertilizer plants, cement works, paper-pulp mills, and woolen mills inject new life into Tasmania's urban centers. The use of local raw materials extends the benefit to primary producers. Third, a fuller realization of the attractions which Tasmania has for the mainland holiday seeker and for the overseas tourist provides an important new source of income for many phases of business.

With those shifts in economic interest, and with a marked decline in birth rate it appears that Tasmania will in the future be able to hold a larger share of its natural population increase in competition with the rapidly maturing states on the mainland.

Exhibits at the Ann Arbor Meeting

For a number of years increasing attention has been paid to graphic presentation at the annual meetings. This tendency was so marked this year as to occasion much favorable comment. As has been the custom in the recent past, ample space for displaying graphic matter was provided during the period covered by the meeting. As usual, the exhibits fall into three groups: newly published wall maps and other graphic items issued commercially by the great map houses and others; maps, photographs, and models of work recently completed by individual geographers or by groups, or still in progress; graphic illustrations of papers on the program.

This year's exhibit was especially notable for its showing of maps, graphs, photographs, and even instruments and archeological objects associated with papers. Many of these were reproduced on slides and shown on the screen as their authors spoke. A large proportion of those who attended the sessions availed themselves of the opportunity to study at leisure these materials, either before or after listening to the papers which they illustrated. Papers which were accompanied by exhibits are so indicated in the Abstracts, to be found on pages 38-73.

Several displays dealt with portrayal of physical aspects of the earth. F. A. Stilgenbauer offered a "Lobate Globoid" projection of the world as a base map on two scales. J. O. Veatch has grouped soil types into units of an order of magnitude more generally useful to geographers in the field than the exceedingly detailed, official soils maps. This grouping is made by means of color applied on a black-and-white base map of soil types, which can be read if desired. From the same hand come sample sheets illustrating a method of rapid land classification. Erwin Raisz displayed maps dealing with land forms of China and with relative relief and average slope. By C. V. V. Crittenden was a map of relative local relief in the Southern Blue Ridge. The federal Soil Conservation Service was represented chiefly by a comprehensive show of its work in micro-climatology in the Muskingum Basin. This included the instruments used, photographs of typical emplacements for them, atlases of original maps of precipitation and temperature for one month, synoptic weather maps for two successive days, and 75 maps showing in seven colors half-hourly conditions of cloudiness, precipitation, wind direction, and wind velocity—all for a period of one day. The Service displayed also maps of soil type and work in micro-climatology.

Several persons related physical and cultural aspects of landscape, either on a single map or on separate sheets at the same scale. Guy-Harold Smith

correlated average slope of a small area with land in harvested crops. A. H. Meyer correlated natural and cultural features of the Kankakee Marsh, using a combination of benday and color. L. D. Black presented soil-pattern and land-use in a strip across the Willamette Valley. S. S. Visser displayed thirteen maps of precipitation intensity in Indiana and ten showing effects of erosion on the terrain of that State.

Another class of maps presented regional analysis, either in whole or in part. Land use maps included:

- (1) a district in India by W. M. Hanley;
- (2) a Japanese Mountain village by R. B. Hall;
- (3) a part of the Valley of Mexico by H. S. Sterling.

R. S. Platt hung fourteen maps (most of them dot maps) of different features of the Isthmus of Panamá. Another exhibit consisted of a map of Prince Rupert and tools of Indians of that vicinity. The Tennessee Valley Authority exemplified the diversity of its work in land utilization by exhibiting maps of (1) retail trade areas, (2) manufacturing in two towns, past, present, and future, (3) present, desirable, and optimum land use in an area north of Chattanooga, and (4) a method for making intensity maps at small cost. The TVA also posted large-scale photographs showing erosion and its checking and power plants and their effects, made apparently as a device for "selling" their project to citizens. To the several maps of manufacturing regions of the United States prepared in recent years, A. J. Wright adds one based on different data from those used by his predecessors.

Among the more novel sorts of maps were those which undertook to portray conditions of settlement. G. T. Trewartha had six maps of the Driftless Area. A. B. Cozzens displayed panoramic views of settlements in Mexico. E. M. Scott and R. Finley showed a profile of rural house-form types from the Great Lakes to the Gulf of Mexico. H. R. Friis presented ten dot maps of population in the United States from 1625 to 1790 and a number of others showing increase and diffusion of the American people. These are contributions to historical geography quite as much as to the geography of settlement.

Historical geography was further represented by S. W. Boggs' charts of discoveries in the South Pacific with special reference to American participation. W. L. G. Joerg sent in a display covering proposed "internal improvements" between 1825 and 1835; the maps have been recently discovered by the staff of the newly created National Archives. Lawrence Martin posted facsimiles of maps dating from the period of the ratification of the Constitution of the United States. The collection comprises the United States as it then was, and each of the original states, including the components which later became Maine, Vermont, Kentucky, and North Carolina.

This project has been carried out under the direction of the United States Constitution Sesquicentennial Commission. Several of the maps are reproduced, as samples of the display, on succeeding pages.

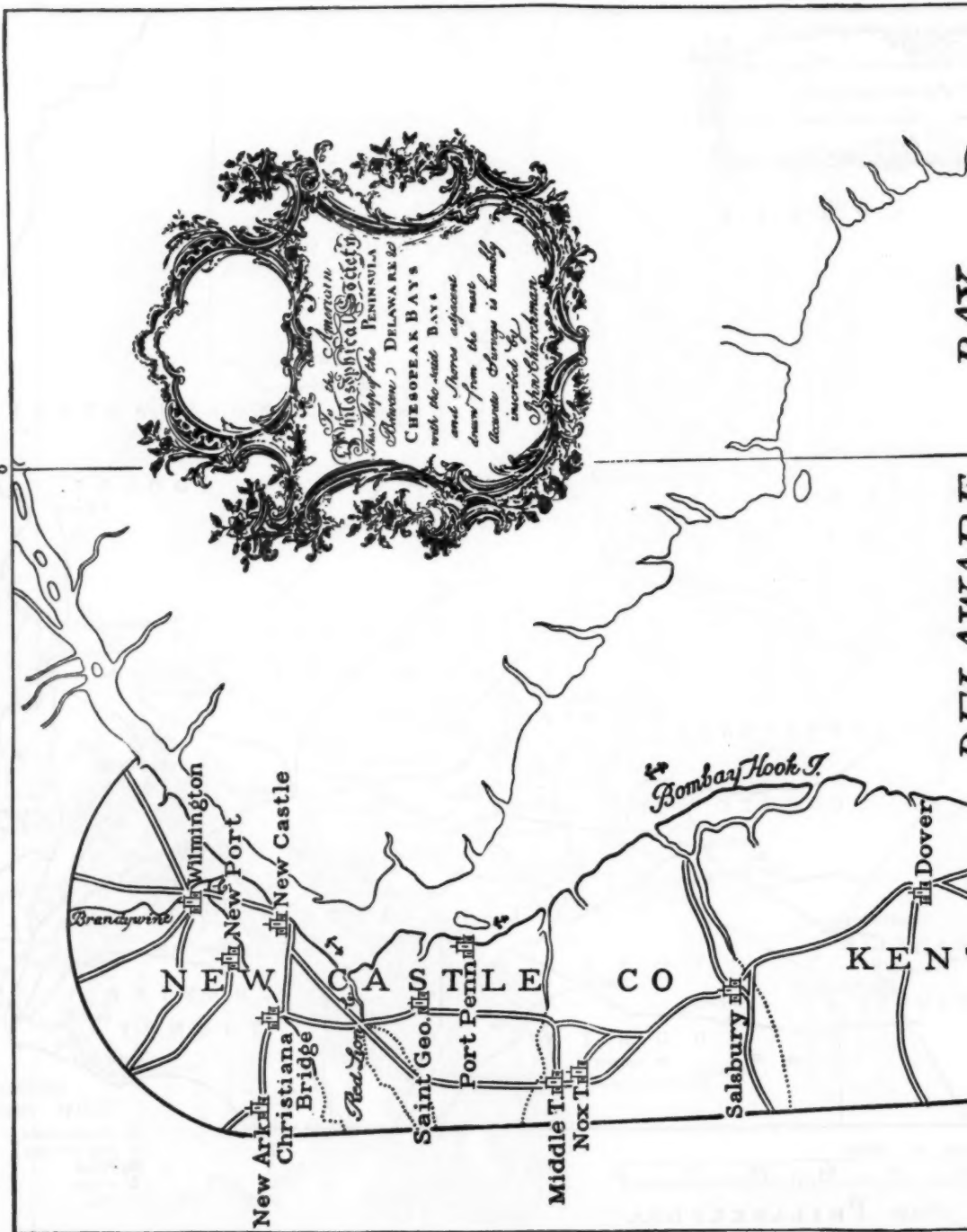
Among the exhibits of scientific work those made by federal commissions, services, and authorities are noteworthy returns from the increased number of geographers engaged by governmental agencies, during the past half decade.

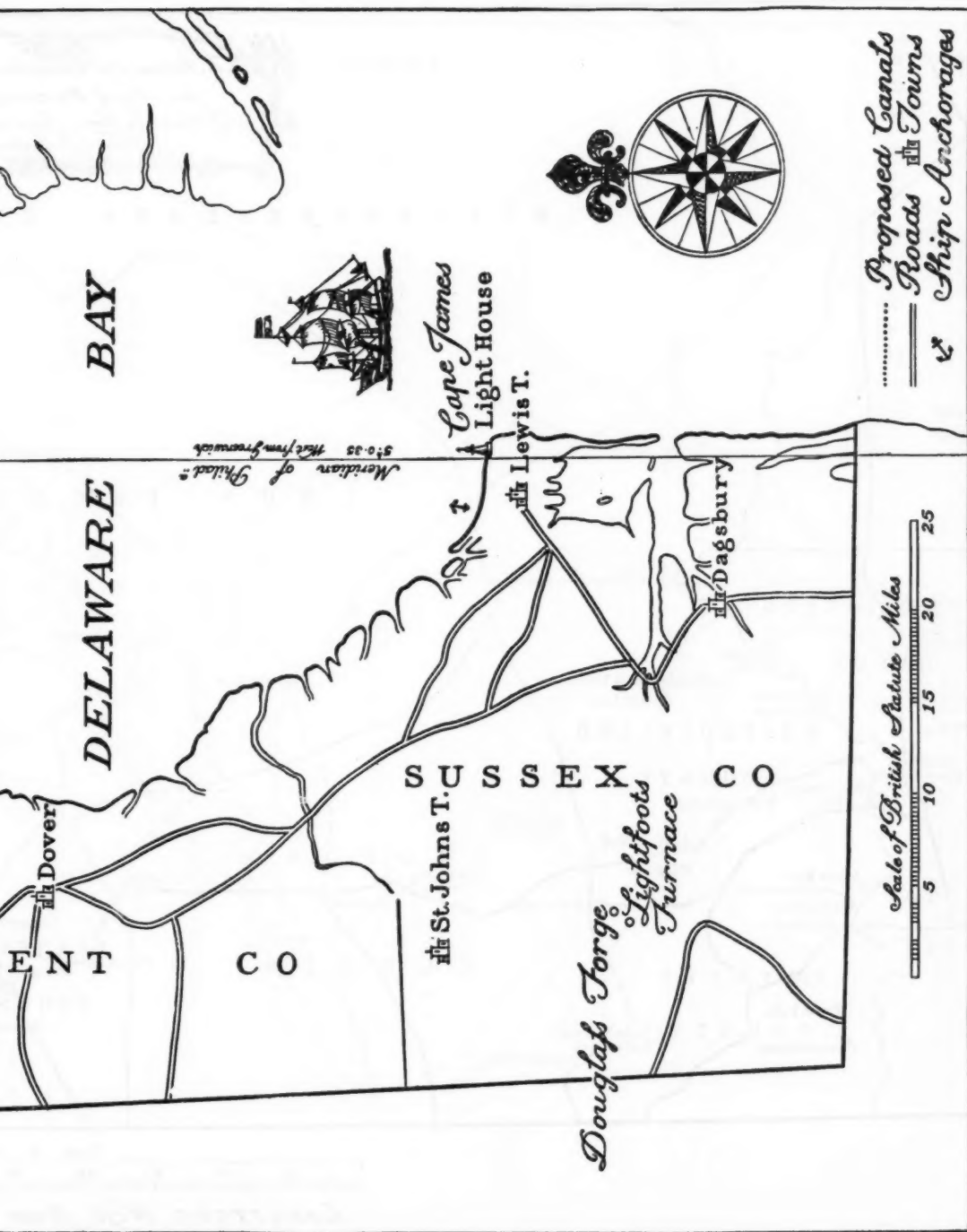
Two displays called attention to scientific cartography of remote foreign countries. A number of printed maps showing the U.S.S.R. and parts of Soviet Russia were taken from the Soviet World Atlas, and were exhibited by George B. Cressey. A relief model of a district in Japan made for D. D. Crary, and topographic maps of the same area, disclose the fine delicacy of the work being done in that country.

The exhibits of commercial firms included many novelties, and were perhaps even more comprehensive than the usual excellent showing made by these companies. E. E. Lackey demonstrated a patented device of his invention which shows all grades of distortion possible with the several commonly used map projections. This is accomplished by mechanical manipulation before a projecting lantern, of cellophane screens bearing the grids.

Of interest to members of the Association was a dot map showing the distribution of the membership as of July, 1937.

DELAWARE ~ 1787



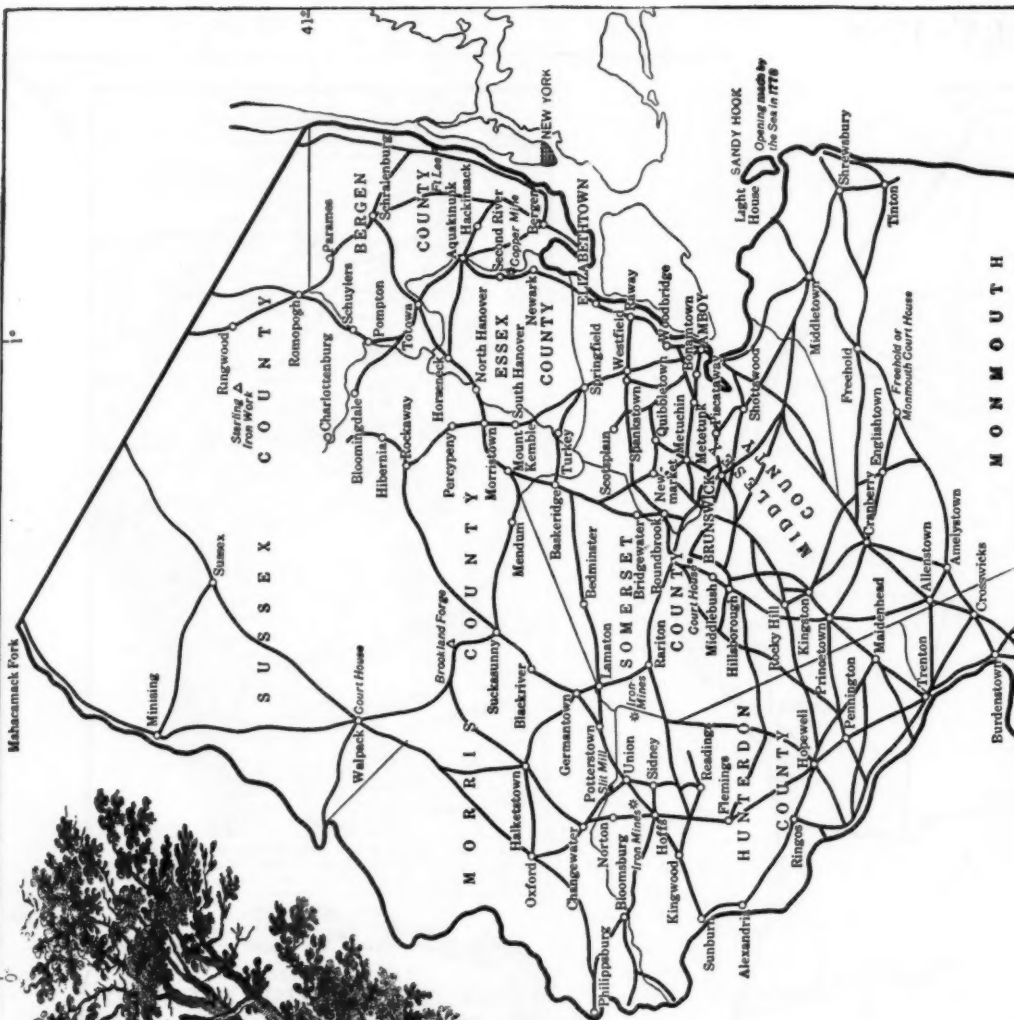


Simplified from a 1787 map by John Churchman. Original in the Library of Congress.
Issued by United States Constitution Sesquicentennial Commission on the 150th Anniversary of the Constitution.

NEW JERSEY ~ 1787

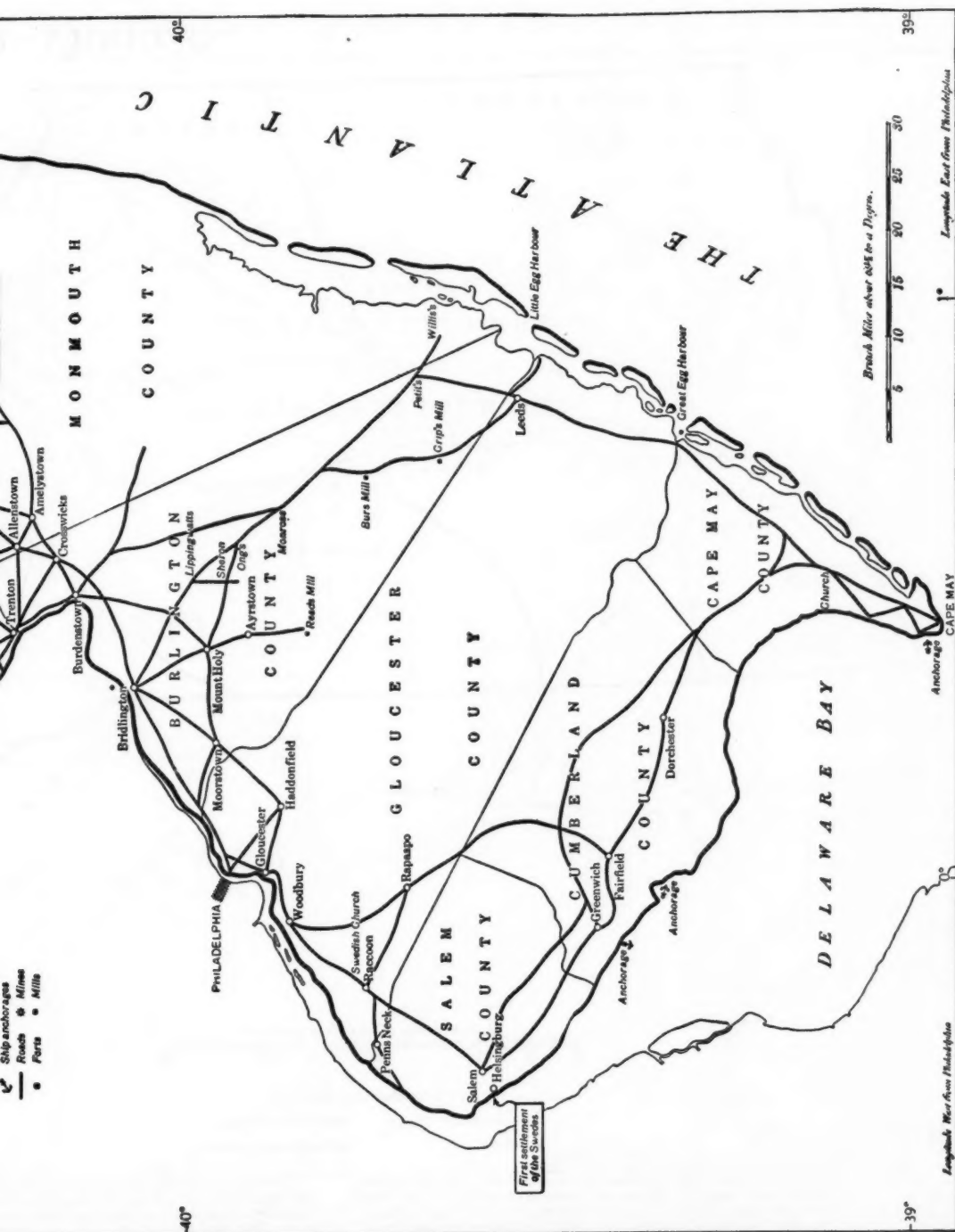


LONDON DEC 1. 1778



REFERENCES

- County boundaries
- Δ Iron Works, Forges
- ⚓ Ship anchorages
- Roads
- Mills
- Forts
- Mills



Longitude West from Philadelphia
 Longitude East from Philadelphia
 Simplified from an original map in the Library of Congress-William Faden, publisher, Bernard Ratzer, Gerard Banker, and others, surveyors.
 Issued by United States Constitution Sesquicentennial Commission on the 150th Anniversary of the Constitution.

CONNECTICUT



Facsimile of part of an original map in the Library of Congress. The map here reproduced is a Dutch plagiarism, printed at Amsterdam, Holland, by Covens and Mortier, in 1780, and taken literally from an American original, compiled and printed at New Haven, Connecticut, in 1777 by Bernard Romans. This is one of a series of similar maps depicting

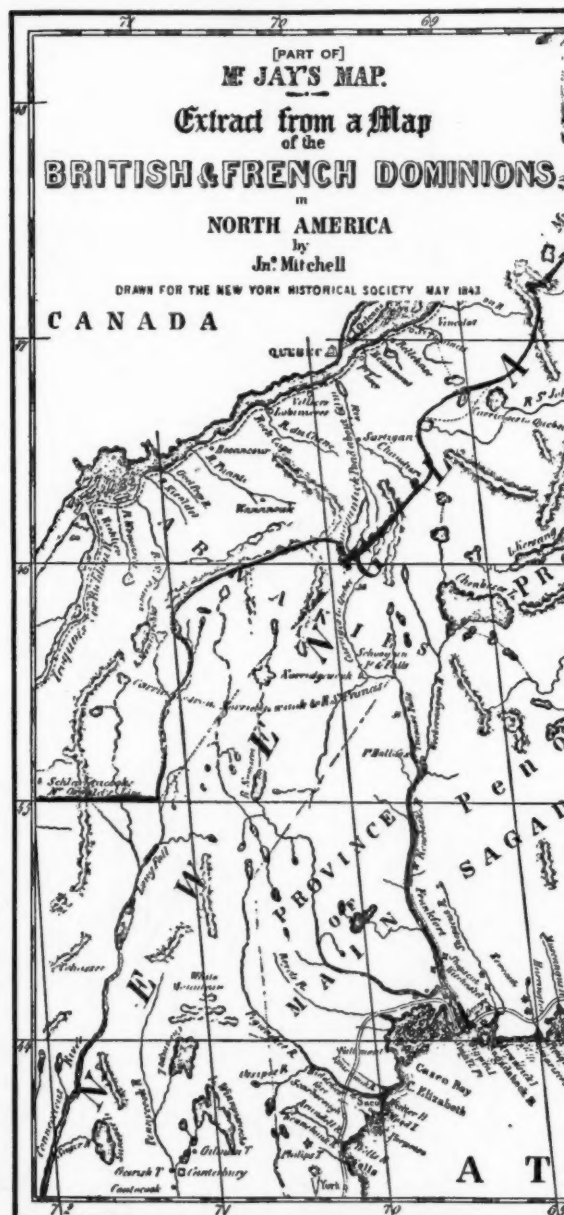
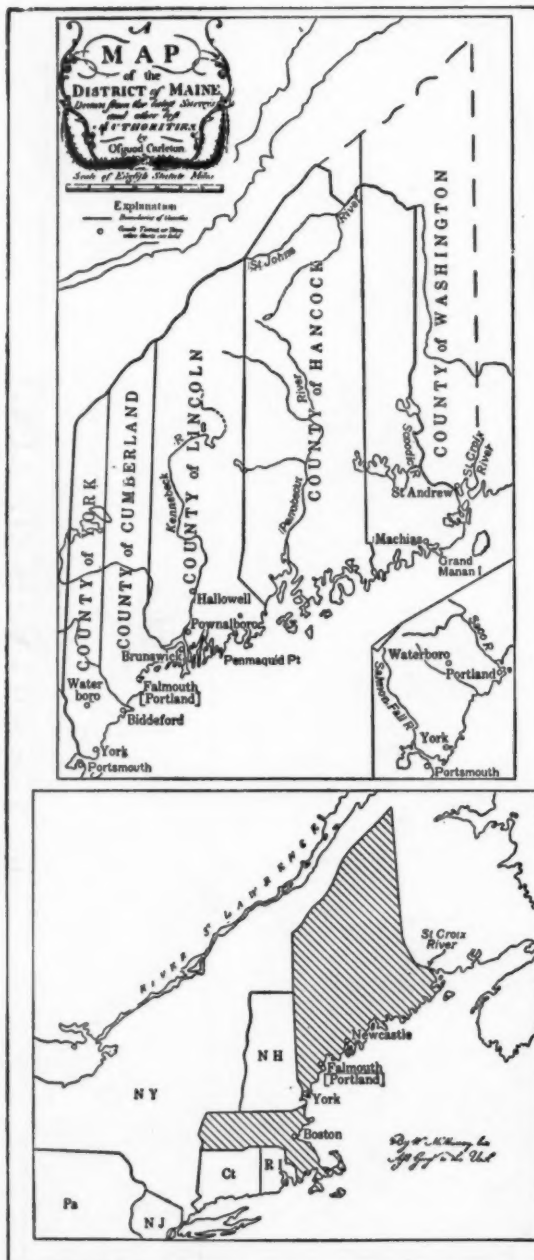
the 18 original States from New Hampshire to Georgia. There will be at least 18 maps in the series, one for each State, including Tennessee (former portions of Massachusetts, Virginia, and North Carolina) as well as two maps of the United States of that period.

CTICUT ~1788



shire to Georgia at the time of the formation of the maps in the series, including Maine, Kentucky, and Massachusetts, Virginia, and North Carolina, respectively) of that period. Issued on the 150th anniversary

of the ratification of the Constitution by Connecticut. For information regarding the distribution of these maps and of the series of 18 large maps, in color, from which these simplified maps were made, write The United States Constitution Sesquicentennial Commission, Washington, D. C., Sol Bloom, Director General.



Simplified from original maps in the Library of Congress published in 1785 (Mitchell's map), in 1795 (Carlson's map), and in 1784 (McMurray's map), respectively. This is one of a series of similar maps depicting the 13 original States from New Hampshire to Georgia at the time of the

formation of the Constitution. There will be at least 18 maps in the series, including Massachusetts, Virginia, and Tennessee (former portions of Massachusetts, Virginia, and Tennessee), as well as two maps of the United States of that period. Issued on

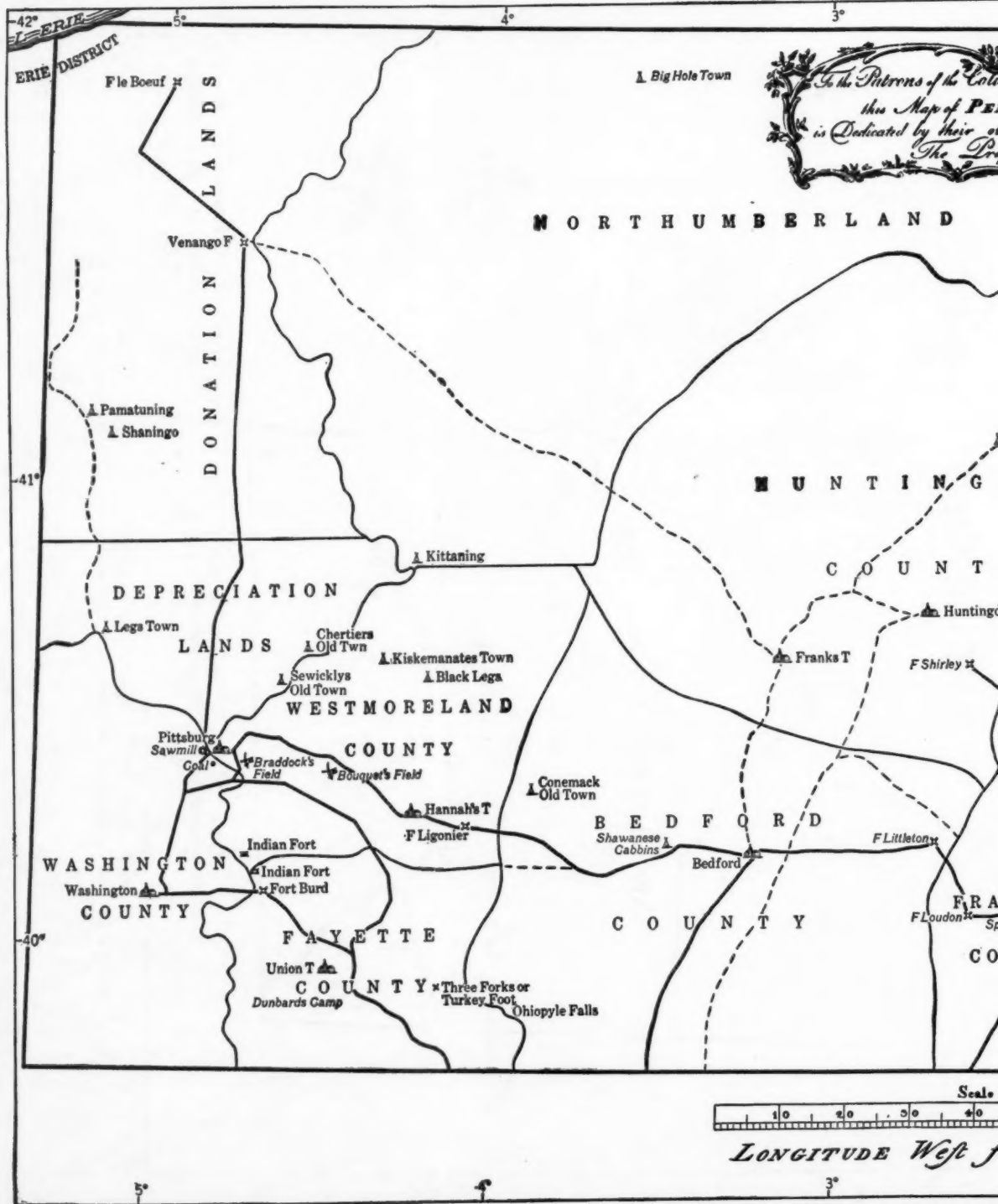
1788 MASSACHUSETTS



last 18 maps in the series, including Maine, Ken-
ussetta, Virginia, and North Carolina, respectively)
period. Issued on the 150th anniversary of the

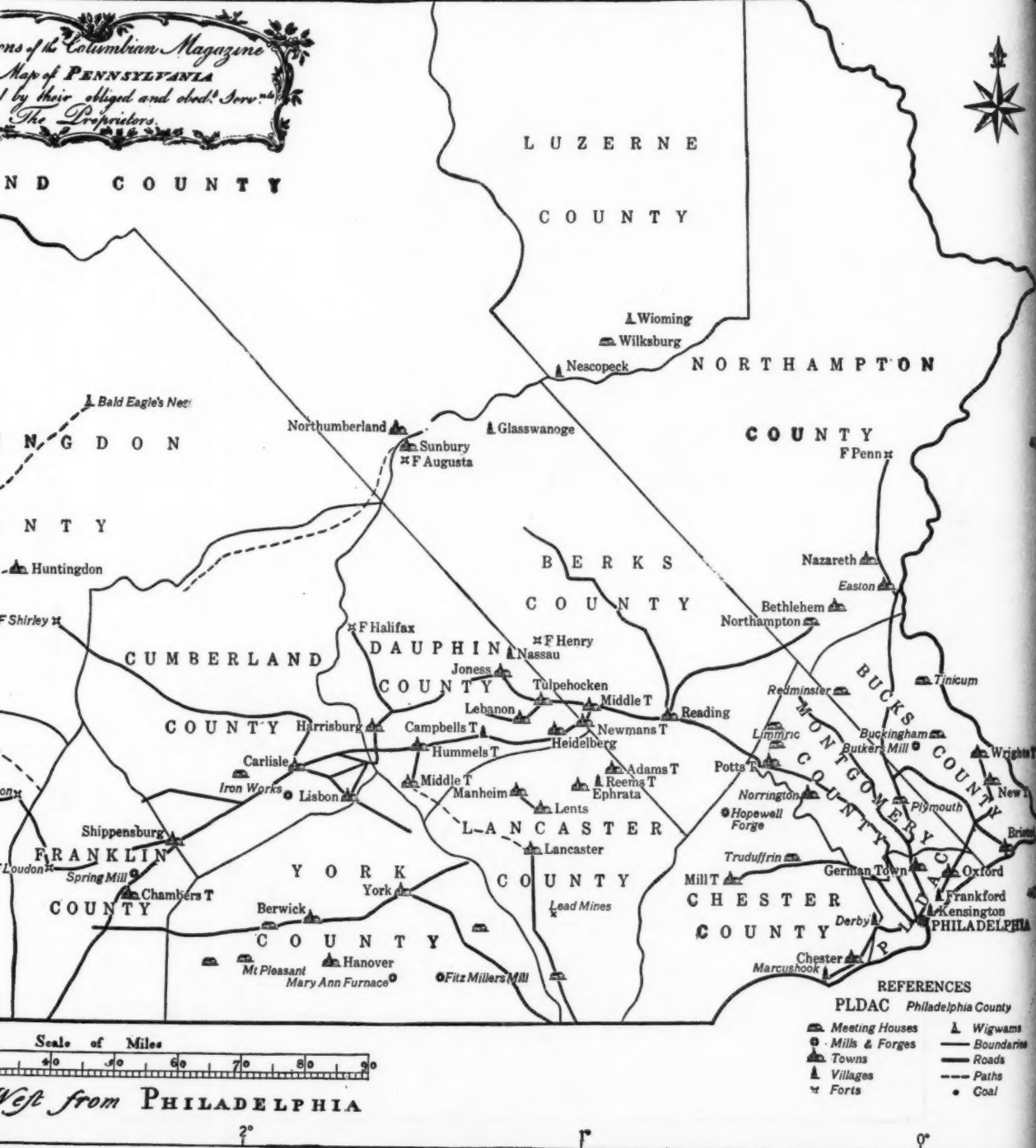
ratification of the Constitution. For information regarding the distribution of these maps and of the
series of 18 large maps, in color, from which these simplified maps were made, write *United States
Constitution Sesquicentennial Commission, Washington, D. C. Sol Bloom, Director General*

PENNSYLVANIA



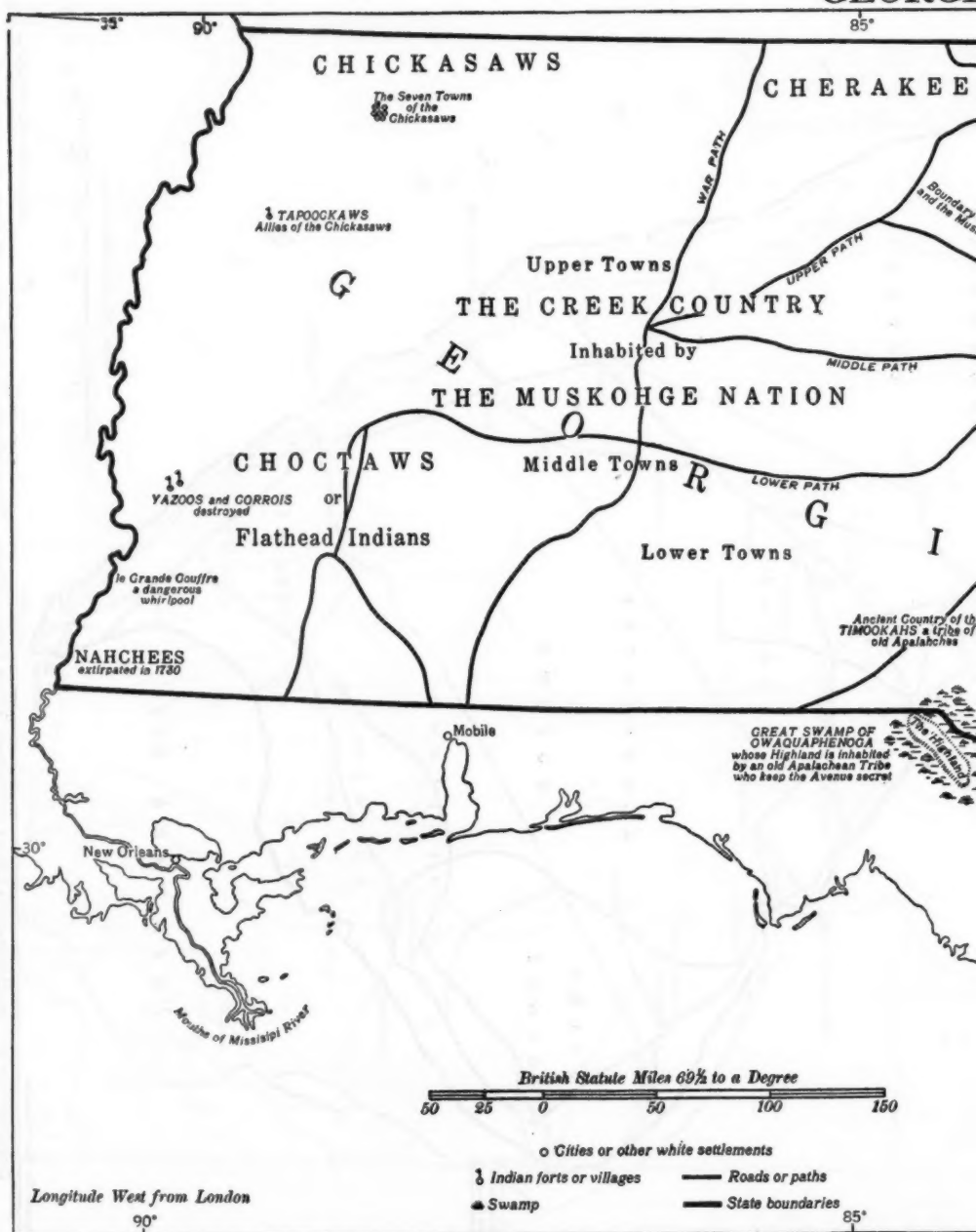
Simplified from an original 1787 map in the Library of Congress which was published in the Colonial
Issued by United States Constitution Sesquicentennial

SYLVANIA ~ 1787



In the Columbian Magazine of Philadelphia, Nicholas Scull's large map of Pennsylvania being the ultimate source.
 centennial Commission on the 150th Anniversary of the Constitution.

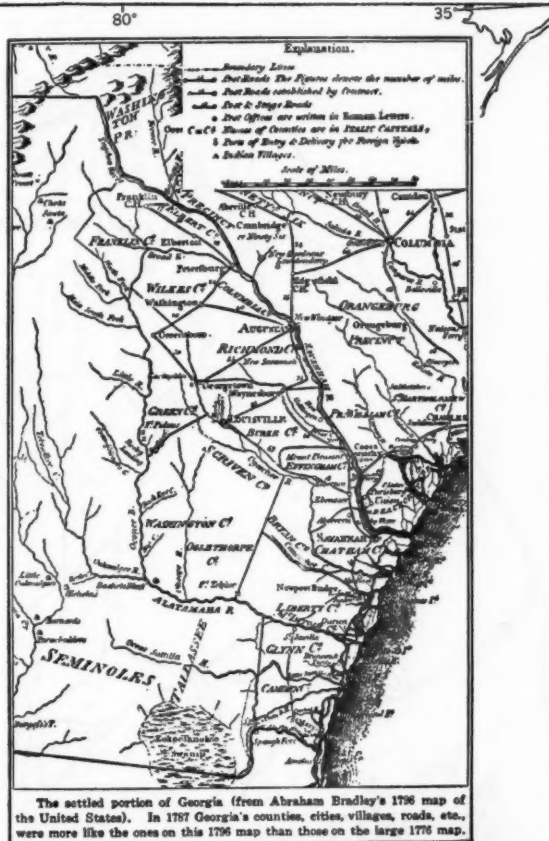
GEORGIA



Simplified from maps by Bernard Romans (main map) and by Abraham Bradley (insert map). Originals in the Library of Congress. The map here reproduced is one of a series of similar maps depicting the 13 original States from New Hampshire to Georgia at the time of formation of the Constitution.

There will be at least 18 maps in this series, one for each of the original States and Tennessee (former portions of Massachusetts and Tennessee respectively) as well as two maps of the Nation on the 150th anniversary of the ratification of the Constitution.

GEORGIA-1788



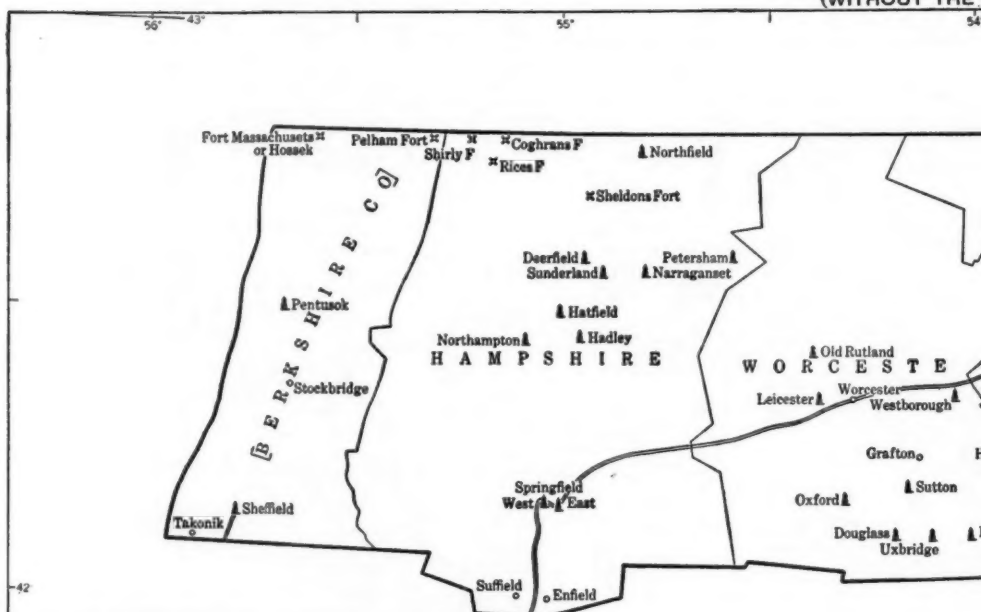
The settled portion of Georgia (from Abraham Bradley's 1736 map of the United States). In 1787 Georgia's counties, cities, villages, roads, etc., were more like the ones on this 1736 map than those on the large 1776 map.



at 18 maps in the series, including Maine, Kentucky, portions of Massachusetts, Virginia, and North Carolina, two maps of the United States of that period. Issued by the ratification of the Constitution by Georgia.

For information regarding the distribution of these maps and of the series of 18 large maps, in color, from which these simplified maps were made, write The United States Constitution Sesquicentennial Commission, Washington, D. C., Sol Bloom, Director General.

MASSACHUSETTS (WITHOUT THE

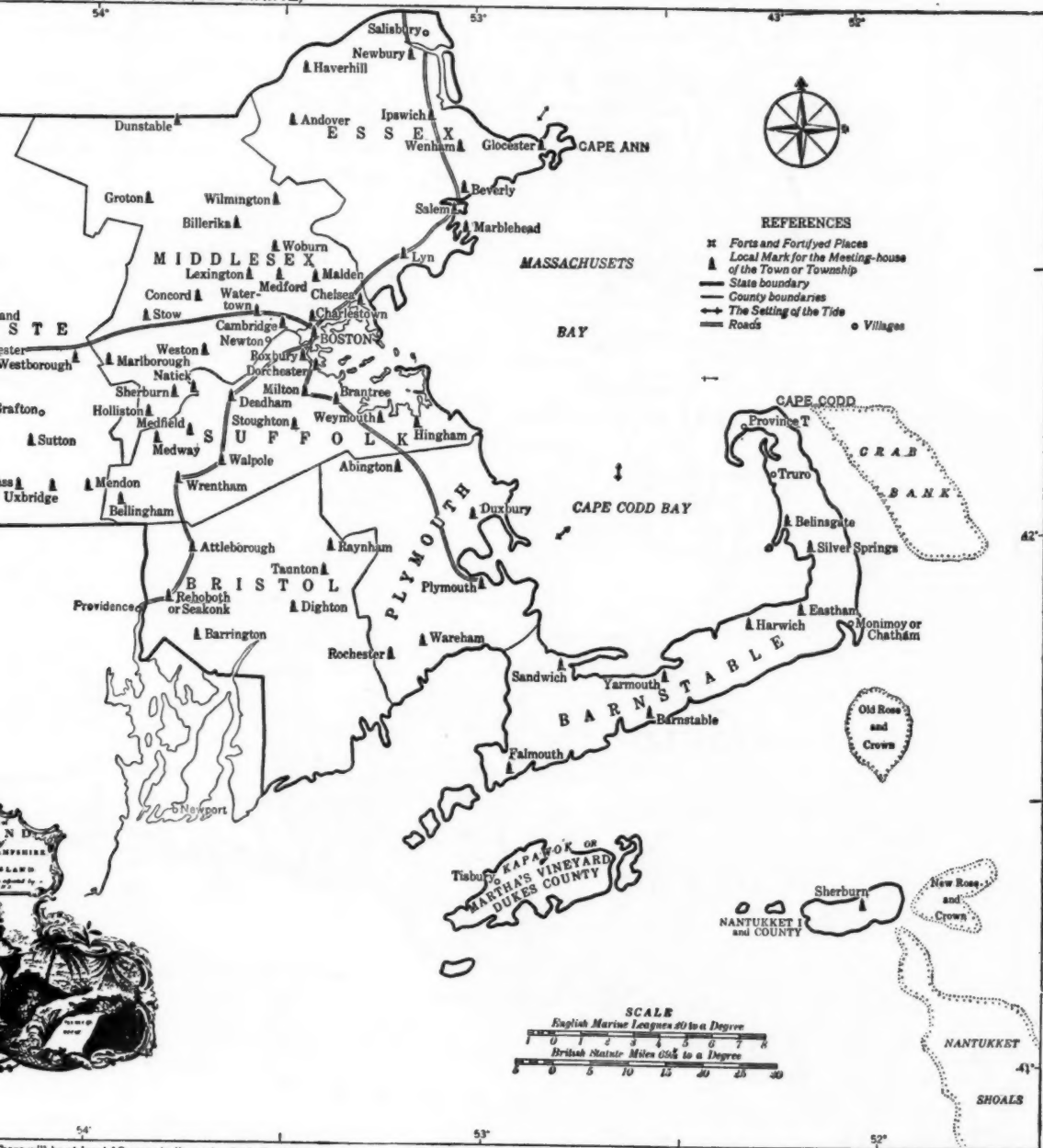


Simplified from maps by John Green (main map) and by Abraham Bradley, Jr. (insert map). Originals in the Library of Congress. The map here reproduced is one of a series of similar maps depicting the 13 original States from New Hampshire to Georgia at the time of the formation of the

Constitution. There will be at Kentucky, and Tennessee (from North Carolina, respectively) as that period. Issued on the 18

MASSACHUSETTS 1788

(WITHOUT THE DISTRICT OF MAINE)



There will be at least 18 maps in the series, including Maine, Tennessee (former portions of Massachusetts, Virginia, and respectively) as well as two maps of the United States of the United States of America on the 150th anniversary of the ratification of the

Constitution. For information regarding the distribution of these maps and of the series of 18 large maps, in color, from which these simplified maps were made, write United States Constitution Sesquicentennial Commission, Washington, D. C., Sol Bloom, Director General.

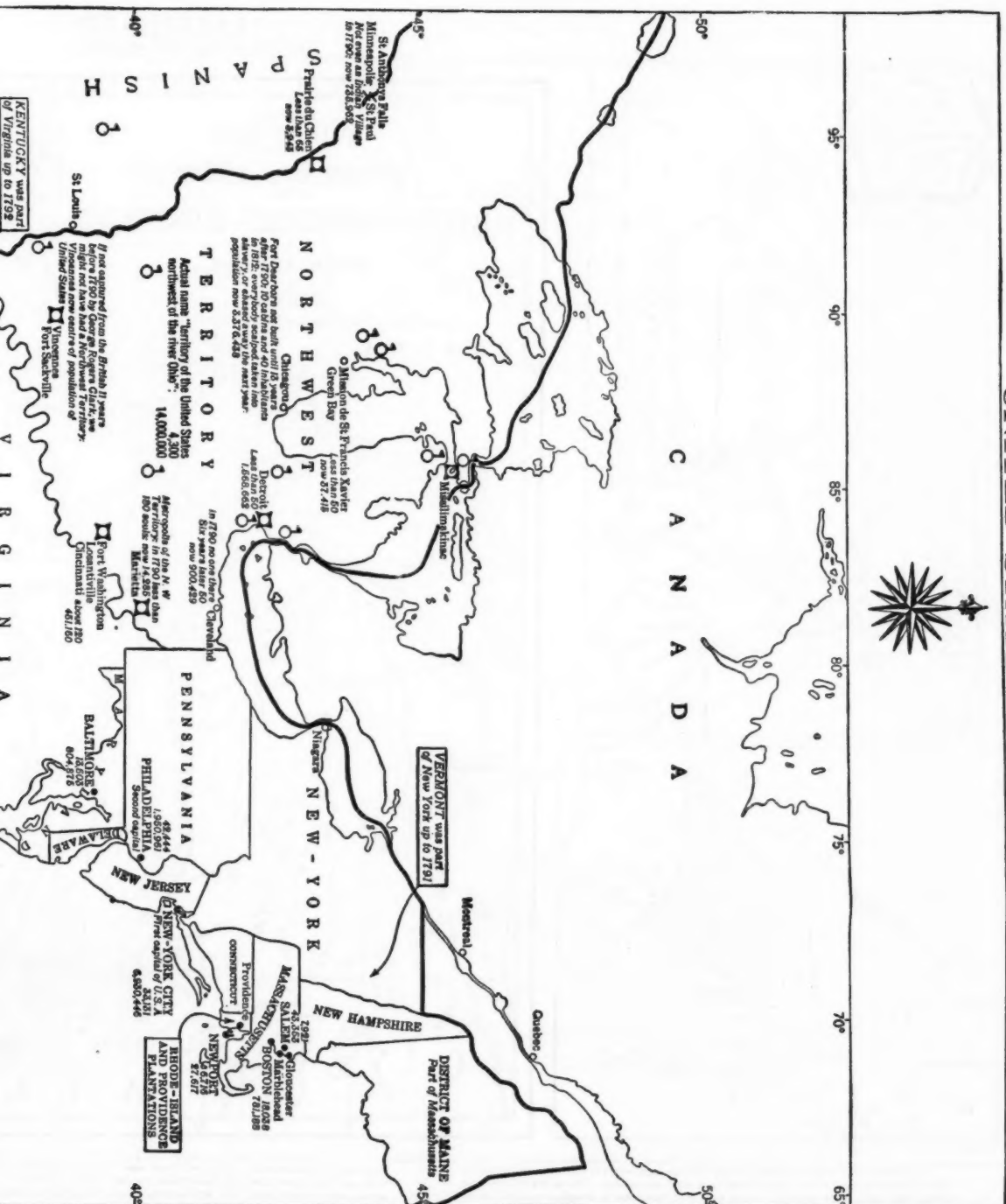




Fig. 1.—Air photograph of the mouth of the Menominee River that south of the river is Marinette, Wis. The Grassy Island-Sugar near the Michigan shore of the river, nearly to the highway bridge



Menominee River in 1930. Reproduced by permission of the U. S. Army Air Corps. The city north of the river is Menominee, Mich., and the Sugar Island area extends from a point just west of the oblique highway bridge at the left margin of the picture eastward, to the highway bridge which crosses the river at right angles not far from its mouth.

